WEST VIRGINIA
SECRETARY OF STATE

JOE MANCHIN III

ADMINISTRATIVE LAW DIVISION

Form #2

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OFFICE WEST VIRGINIA
SECRETARY OF STATE

NOTICE OF A COMMENT PERIOD ON A PROPOSED RULE

AGENCY: West Virginia Board of Education TITLE NUMBER: 126

RULE TYPE: Legislative ; CITE AUTHORITY: W. Va. Constitution, Article XII, §2; W.Va. Code §18-2-5 and §18-9A-22

AMENDMENT TO AN EXISTING RULE: YES X NO ____

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 44 M

TITLE OF RULE BEING AMENDED: Content Standards and Objectives for West Virginia Schools (2520)

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: ____

TITLE OF RULE BEING PROPOSED: ____

IN LIEU OF A PUBLIC HEARING, A COMMENT PERIOD HAS BEEN ESTABLISHED DURING WHICH ANY INTERESTED PERSON MAY SEND COMMENTS CONCERNING THESE PROPOSED RULES. THIS COMMENT PERIOD WILL END ON June 21, 2002 AT 4:45 p.m. . ONLY WRITTEN COMMENTS WILL BE ACCEPTED AND ARE TO BE MAILED TO THE FOLLOWING ADDRESS:

Norma K. Miller Director

Office of Program Services

West Virginia Department of Education

1900 Kanawha Boulevard East, Bldg. 6, Room 243

Charleston, West Virginia 25305-0330

THE ISSUES TO BE HEARD WILL BE LIMITED TO THE PROPOSED CONTENT STANDARDS AND OBJECTIVES FOR TECHNICAL AND ADULT EDUCATION COURSES

William J. Luff, Jr.
Deputy State Superintendent of Schools

ATTACH A **BRIEF** SUMMARY OF YOUR PROPOSAL

SCANNED

98.30

EXECUTIVE SUMMARY

POLICY 2520
CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS

Background:
Policy 2520 defines the content standards (or instructional goals) and objectives for the programs of study required by Policy 2510 and establishes a standardized format for such. The original effective date of the policy was July, 1997. In October, 2001, a revision of the Policy incorporating the Content Standards and Objectives for Mathematics, Reading/English Language Arts, Science, Social Studies and Technology was presented to the West Virginia Board of Education. It was placed on public comment and was approved by the Board on December 13, 2001, to be effective July 1, 2003.

Purpose:
The purpose of this Board item is to seek approval for Policy 2520 as it has been revised to include content standards and objectives for the additional courses listed below.

Summary of Revisions:
The revision adds to the Content Standards and Objectives the courses for Technical and Adult Education in the areas of Agricultural Education, Business Education, Diversified Cooperative Training, Family & Consumer Sciences, Health Occupations, Lodging Management, Marketing Education, Occupational Family & Consumer Science, Technical and Industrial Education, Technology Education and Travel West Virginia.

NOTE: Because of the length of the new section for Technical and Adult Education courses, the additions have not been underlined. All pages from page 1000 to the end of the Content Standards and Objectives are added pages.

No changes were made to the Content Standards and Objectives for Mathematics, Reading/English Language Arts, Science, Social Studies and Technology.

Slight changes using the standard strikethroughs and underlines were made to the Table of Contents and the Explanation of Terms to reflect the addition of the new Content Standards and Objectives.

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OFFICE WEST VIRGINIA SECRETARY OF STATE

TITLE 126
LEGISLATIVE RULE
BOARD OF EDUCATION

SERIES 44
CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS (2520)

§126-44-1. General.

1.1. Scope. – West Virginia Board of Education Policy 2510 provides a definition of a delivery system for, and an assessment and accountability system for, a thorough and efficient education for West Virginia public school students. Policy 2520 defines the content standards (or instructional goals) and objectives for the programs of study required by W.Va. 126CSR42 (Policy 2510).

1.2. Authority. – W.Va. Constitution, Article XII, §2, W.Va. Code §18-2-5 and §18-9A-22.

1.3. Filing Date. -- ~~December 18, 2001.~~

1.4. Effective Date. -- July 1, 2003.

1.5. Repeal of former rule. -- This legislative rule amends W.Va. 126CSR44 (Policy 2520).

§126-44-2. Purpose.

2.1. This policy defines the content standards (or instructional goals) and objectives for the programs of study required by Policy 2510 in reading and English language arts, mathematics, science, social studies, health, dance, music, theatre, visual art, geography, foreign languages, driver education, physical education, ~~and~~ the Robert C. Beach Vocational Agriculture Credit, and technical and adult courses.

§126-44-3. Incorporation by Reference.

3.1. A copy of Content Standards and Objectives for West Virginia Schools is attached and incorporated by reference into this policy. Copies may be obtained in the Office of the Secretary of State and in the West Virginia Department of Education, Office of Instructional Services and Office of Program Services.

§126-44-4. Summary of the Content Standards (or Instructional Goals) and Objectives.

4.1. The West Virginia Board of Education has the responsibility for establishing high quality standards pertaining to all educational standards pertaining to all education programs (W.Va. Code §18-9A-22). The content standards and objectives provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace and further education. The document includes: content standards for reading and English language arts, mathematics, social studies, science, health, dance, music, theatre, visual art, geography, foreign languages, driver education, physical education, ~~and~~ the Robert C. Beach Vocational Agriculture Credit and technical and adult courses. Also included are program charts for K-2, 3-4, 5-8, and 9-12; instructional practices for K-12; an explanation of terms; objectives that reflect a rigorous and challenging curriculum, process/workplace objectives and computer/technology objectives.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
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Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

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Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
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5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.9-12.4.1 use telecommunications and online resources for the purpose of communicating with audiences inside and outside of the classroom.

Performance Descriptors (TEC.PD.9-12.4)
- **Mastery**
  High school students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report result;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.9-12.5.1 use a variety of strategies to acquire information from electronic resources;
TEC.9-12.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.9-12.5)
- **Mastery**
  High school students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems; routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.9-12.6.1 investigate and apply expert systems, intelligent agents, and simulations in real world situations.

Performance Descriptors (TEC.PD.9-12.6)
- **Mastery**
  High school students performing at the mastery level select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning.

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.

David Stewart
State Superintendent of Schools

Policy 2520: Content Standards and Objectives for West Virginia Schools

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December 2001

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David Stewart
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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.9-12.4.1 use telecommunications and online resources for the purpose of communicating with audiences inside and outside of the classroom.

Performance Descriptors (TEC.PD.9-12.4)
- **Mastery**
  High school students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report result;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.9-12.5.1 use a variety of strategies to acquire information from electronic resources;
TEC.9-12.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.9-12.5)
- **Mastery**
  High school students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems; routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.9-12.6.1 investigate and apply expert systems, intelligent agents, and simulations in real world situations.

Performance Descriptors (TEC.PD.9-12.6)
- **Mastery**
  High school students performing at the mastery level select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning.

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.

David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions.. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Note: The content standards and objectives for Technical and Adult Education do not include performance descriptors.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts, the WVEIS course code for technical courses);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1. 0101.S.1 refers to Agriculture and Natural Resources I content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology, the WVEIS code for technical courses);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses, ~~and~~ grades 11-12 science courses, and technical courses, which use no grade designation);
- The number of the content standard addressed; and

- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard. 0101.1.1 refers to Agriculture and Natural Resources I content standard #1, objective #1.

Numbering of Performance Descriptors

The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)

Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this ~~version~~ section of Policy 2520 is ~~"200112."~~ "200207, indicating that the Board approval date is ~~December 2001~~ July, 2002.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

Agriculture and Natural Resources I

This area of study is designed to provide students with core skills and competencies needed for pursuing careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Orientation to the Agriculture and Natural Resource Industries (0101.S.1)
Students will:

- describe the natural resource industry.

Agriculture and Natural Resource Industries Objectives
Students will:

0101.1.1 Identify appropriate career opportunities in agriculture and natural resources.
0101.1.2 Relate the importance of agriculture and natural resources to state, national and international economies.
0101.1.3 Identify major agricultural and natural resources issues.
0101.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Leadership in Agriculture and Natural Resources (0101.S.2)
Students will:

- show leadership skills necessary for success in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0101.2.1 Participate in meetings using parliamentary law.
0101.2.2 Use interpersonal skills in team problem solving.
0101.2.3 Prepare and deliver a brief presentation on an agricultural or natural resources topic.

Standard 3: Developing Work-Based Experience Program (0101.S.3)
Students will:

- develop work-based experience programs in agriculture and natural resources.

Developing Work-Based Experience Program Objectives
Students will:

0101.3.1 Define and explain supervised experience programs in agriculture and natural resources.
0101.3.2 Explore opportunities for work-based experiences through supervised experience programs.
0101.3.3 Define record keeping terms for supervised experience programs.
0101.3.4 Complete budgets for potential supervised experience programs.
0101.3.5 Establish a supervised experience program in agriculture or natural resources.
0101.3.6 Utilize marketing principles.
0101.3.7 Demonstrate competency in agriscience problem solving.

Standard 4: Computer Applications in Agriculture and Natural Resources (0101.S.4)
Students will:

- Display skills involving computer application in natural recourses.

Computer Applications in Agriculture and Natural Resources Objectives
Students will:

0101.4.1 Utilize keyboarding skills to operate agriculture and natural resources software.
0101.4.2 Search the Internet to secure agriculture and natural resources information.

Standard 5: Applying Basic Mechanical Skill in Agriculture and Natural Resources (0101.S.5)
Students will:

- demonstrate basic mechanical skills.

Basic Mechanical Skill in Agriculture and Natural Resources Objectives
Students will:
0101.5.1 Demonstrate principles of safety.
0101.5.2 Demonstrate basic tool conditioning skills.
0101.5.3 Demonstrate basic carpentry skills.
0101.5.4 Demonstrate basic welding skills.
0101.5.5 Demonstrate basic cold metal skills.

Standard 6: Introductory Animal Science and Production (0101.S.6)
Students will:
- demonstrate animal science and production skills.

Animal Science and Production Objectives
Students will:
0101.6.1 Explore various animal production opportunities.
0101.6.2 Explain management/health requirements of animals.
0101.6.3 Identify desirable characteristics for selecting large and small animals.
0101.6.4 Identify different types of animal digestive systems.

Standard 7: Introductory Plant Science and Production (0101.S.7)
Students will:
- demonstrate plant science and production skills.

Introductory Plant Science and Production Objectives
Students will:
0101.7.1 Explore various plant production opportunities.
0101.7.2 Explain plant production requirements (macronutrients, micronutrients, pH).
0101.7.3 Identify the major parts of a plant.
0101.7.4 Describe the function of the major parts of a plant.

Standard 8: Basic Environmental Concerns (0101.S.8)
Students will:
- demonstrate basic environmental skills.

Basic Environmental Concerns Objectives
Students will:
0101.8.1 Explain major environmental concerns - e.g. acid rain, air pollution, soil degradation and surface and groundwater pollution.
0101.8.2 Use measurement devices to collect and test soil and water samples.
0101.8.3 Explain the concepts of soil science and their relationship to agriculture.

Standard 9: Investigations and Problem Solving (0101.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0101.9.1 Engage in hands-on activities demonstrating agriscience and natural resources concepts and principles.

Agriculture and Natural Resources II

This area of study is designed to provide students with core skills and competencies needed for pursuing advanced careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Developing Work Based (0102.S.1)
Students will:

- develop a work based experience program.

Developing Work Based Objectives
Students will:

0102.1.1 Analyze records of supervised experience programs to make sound decisions for expanding.
0102.1.2 Identify marketing trends and cycles.
0102.1.3 Identify employment trends and cycles.
0102.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Computer Applications (0102.S.2)
Students will:

- utilize computer applications in agriculture and natural resources.

Computer Applications Objectives
Students will:

0102.2.1 Use computer resources to solve problems related to work-based experience programs.

Standard 3: Ecosystem Management (0102.S.3)
Students will:

- understand ecosystem management.

Ecosystem Management Objectives
Students will:

0102.3.1 Explain the impact of agriculture and forestry on ecosystems.
0102.3.2 Explain the relationship of wetlands to agriculture and natural resources.
0102.3.3 Test, interpret and analyze water and soil test data.

Standard 4: Leadership in Agriculture and Natural Resources (0102.S.4)
Students will:

- display leadership skills in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0102.4.1 Conduct meetings using parliamentary law.
0102.4.2 Serve as a small group team leader.
0102.4.3 Present prepared and extemporaneous speeches on issues affecting agriculture and natural resources.
0102.4.4 Participate in committees and leadership development activities.
0102.4.5 Participate in committee service.

Standard 5: Application of Mechanical Skills (0102.S.5)
Students will:

- apply mechanical skills to augment agriculture and natural resource activities.

Application of Mechanical Skills Objectives
Students will:
0102.5.1 Read and transfer measurements.
0102.5.2 Develop bill of materials and calculate costs.
0102.5.3 Demonstrate advanced tool conditioning skills.
0102.5.4 Demonstrate advanced welding skills.
0102.5.5 Demonstrate building construction skills.
0102.5.6 Service and maintain small engines.
0102.5.7 Apply mechanical skills in repair and construction projects related to supervised experience programs.

Standard 6: Advanced Animal Science and Production (0102.S.6)
Students will:
- demonstrate advanced animal science reproduction skills.

Advanced Animal Science and Production Objectives
Students will:
0102.6.1 Compare animal digestive systems.
0102.6.2 Analyze nutrient requirements of animals and calculate rations.
0102.6.3 Identify symptoms of nutrient deficiencies.
0102.6.4 Describe the use of feed additives and growth stimulants.
0102.6.5 Explain the role of breeding and selection in animal improvement.
0102.6.6 Recognize steps to maintain animal health.
0102.6.7 Explain biotechnology applications in animal production.

Standard 7: Advanced Plant Science and Production (0102.S.7)
Students will:
- demonstrate advanced plant science and production skills.

Advanced Plant Science and Production Objectives
Students will:
0102.7.1 Describe approved practices in plant nutrition.
0102.7.2 Identify symptoms and management strategies for plant nutrient deficiencies.
0102.7.3 Identify pest management measures.
0102.7.4 Explain biotechnology applications in plant production.

Standard 8: Forestry (0102.S.8)
Students will:
- exhibit skills enhancing selective forestry activities.

Forestry Objectives
Students will:
0102.8.1 Identify trees of major economic importance.
0102.8.2 Identify relationships among forests, wildlife and water resources.
0102.8.3 Select best management practices for timber stand improvement.

Standard 9: Investigations and Problem Solving (0102.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0102.9.1 Students will engage in advanced hands-on activities relating to agriscience and natural resources concepts.

Agriculture Mechanics I

This area of study is designed to provide learners with job entry-level skills in the agricultural mechanics industry. Major instructional concepts include an orientation to mechanics industry, leadership, safety, drawing and blueprinting, shop, hand and power tools.

Standard 1: Orientation to the Agricultural Mechanics Industry (0112.S.1)
Students will:

- describe mechanics as a career.

Agricultural Mechanics Industry Objectives
Students will:
0112.1.1 Identify various career opportunities in agricultural mechanics.
0112.1.2 Develop computer skills.
0112.1.3 Develop resume and job seeking skills.

Standard 2: Leadership in Agricultural Mechanics (0112.S.2)
Students will:

- participate effectively in a group (FFA) setting.

Leadership in Agricultural Mechanics Objectives
Students will:
0112.2.1 Define the function and history of the FFA.
0112.2.2 Identify parliamentary procedure skills need to conduct a meeting.
0112.2.3 Perform individual leadership skills in preparing and presenting a speech.
0112.2.4 Prepare and identify components of a program of activities.

Standard 3: Understanding Safety and Fire Control Procedures (0112.S.3)
Students will:

- maintain a safe working environment.

Understanding Safety and Fire Control Procedures Objectives
Students will:
0112.3.1 Utilize personal safety devices.
0112.3.2 Identify general shop safety rules.
0112.3.3 Maintaining a safe working environment.
0112.3.4 Identify and comply with safety rules relating to operation of farm tractors and equipment.

Standard 4: Understanding and Interpreting Drawing and Blueprints (0112.S.4)
Students will:

- use blueprints to plan projects.

Understanding and Interpreting Drawing and Blueprints Objectives
Students will:
0112.4.1 Apply dimensions to drawings and free hand sketches.
0112.4.2 Calculate costs and bill of materials.

Standard 5: Using Shop Hand and Power Tools (0112.S.5)
Students will:

- safely and correctly demonstrate metal fabrication.

Using Shop Hand and Power Tools Objectives
Students will:

0112.5.1 Identify and use common hand tools and power equipment.
0112.5.2 Perform cold metal procedures - cutting, drilling and threading.
0112.5.3 Perform various arc-welding functions.
0112.5.4 Perform various oxy-acetylene tasks.
0112.5.5 Conduct arc welding projects that relate to SAEs.

Standard 6: Technology Applications (0112.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0112.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0112.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0112.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural mechanics.
0112.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0112.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:

0112.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0112.7.2 Explore careers available in agricultural mechanics.
0112.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0112.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0112.7.5 Demonstrate correct language usage in all oral and written work.
0112.7.6 Perform effectively in both leadership and non-leadership roles.
0112.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0112.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0112.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives

Students will:

0112.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0112.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0112.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0112.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agricultural Mechanics II

This area of study provides students with more advanced concepts and practical application in the areas of leadership, computer application, ag engines, structures, electricity and fencing.

Standard 1: Introduction to Basic Principles of Agricultural Engines – Gasoline and Diesel (0113 .S.1)
Students will:

- **learn the basic principles of agricultural engines – gasoline and diesel.**

Gasoline and Diesel Objectives
Students will:

0113.1.1 Interpret basic principles of agricultural engines.
0113.1.2 Apply principles of tune-up procedure.
0113.1.3 Perform engine overhauls.
0113.1.4 Demonstrate problem solving in operation and maintenance of engines.
0113.1.5 Identify hydraulic systems.
0113.1.6 Identify and use diagnostic testing equipment.

Standard 2: Agricultural Structures (0113.S.2)
Students will:

- **use agriculture construction techniques.**

Agricultural Structures Objectives
Students will:

0113.2.1 Identify basic building construction techniques related to agricultural structures.
0113.2.2 Select and install appropriate fasteners.
0113.2.3 Select kinds and grades of lumber for the job.
0113.2.4 Identify roof designs and materials.
0113.2.5 Exhibit concrete and masonry skills.
0113.2.6 Identify, select and use plumbing fixtures.
0113.2.7 Select and use various painting and finishing materials.

Standard 3: Agricultural Electricity (0113.S.3)
Students will:

- **use proper safety in electrical wiring.**

Agricultural Electricity Objectives
Students will:

0113.3.1 Demonstrate electrical theory and skills with agricultural electrical units.
0113.3.2 Identify terminology, circuits, breakers, switches and service entrance panels based on state codes.
0113.3.3 Identify, select and use electric motors, motor controls, pulley sizes and speeds.
0113.3.4 Demonstrate proper safety procedures in all electrical work.

Standard 4: Fencing (0113.S.4)
Students will:

- **explore fencing for agricultural applications.**

Fencing Objectives
0113.4.1 Identify and understand the various types of fencing, tools and equipment.

0113.4.2 Analyze the economics of various fencing systems.

Standard 5: Agricultural Equipment (0113.S.5)
Students will:

- **maintain, adjust and repair agricultural equipment.**

Agricultural Equipment Objectives
Students will:

0113.5.1 Identify agricultural machinery and equipment.
0113.5.2 Perform maintenances procedures as recommended in service manuals.
0113.5.3 Identify agricultural lubricants and fuels.

Standard 6: Technology Applications (0113.S.6)
Students will:

- **apply technology to investigate real-world problems.**

Technology Applications Objectives
Students will:

0113.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0113.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0113.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to a agricultural mechanics.
0113.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of an agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0113.S.7)
Students will:

- **demonstrate personal and group workplace skills.**

Process/Workplace Skills in Agribusiness Objectives
Students will:

0113.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0113.7.2 Explore careers available in agricultural mechanics.
0113.7.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural mechanics.
0113.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0113.7.5 Demonstrate correct language usage in all oral and written work.
0113.7.6 Perform effectively in both leadership and non-leadership roles.
0113.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0113.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Lab Investigation (0113.S.8)
Students will :

- **safely conduct laboratory investigations and exploratory learning.**

Lab Investigation Objectives

Students will:

0113.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0113.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0113.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0113.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agribusiness Management

Agribusiness management is for students who seek further agriculture, business, advancement and management techniques that will enable them to become successful in owning and operating a business.

Standard 1: Agribusiness Concepts (0131.S.1)
Students will:
- Identify different types of business organizations.

Agribusiness Concepts Objectives
Students will:
0131.1.1 Identify agribusiness organizational structures.
0131.1.2 Distinguish between partnership, limited partnership and joint venture.
0131.1.3 Describe regular and sub-chapter S corporations.
0131.1.4 Explain the difference between cooperatives and corporations.

Standard 2: Agripreneurship (0131.S.2)
Students will:
- describe the risks and rewards of becoming an entrepreneur.

Agripreneurship Objectives
Students will:
0131.2.1 Define entrepreneurship.
0131.2.2 Recognize advantages and disadvantages of being self-employed.
0131.2.3 Identify personal characteristics of successful agripreneurs.
0131.2.4 Explain why businesses succeed.

Standard 3: Preparing a Business Plan (0131.S.3)
Students will:
- develop a business plan and technical resources.

Preparing a Business Plan Objectives
Students will:
0131.3.1 Identify and complete the components of a business plan.
0131.3.2 Prepare a cash flow statement for a proposed agribusiness.
0131.3.3 Identify sources of technical assistance in establishing and maintaining a successful business.
0131.3.4 Explain risk management.

Standard 4: Business Law (0131.S.4)
Students will:
- identify the basic business law involved in agriculture.

Business Law Objectives
Students will:
0131.4.1 Identify the types and sources of laws.
0131.4.2 Describe liability and negligence laws.
0131.4.3 Describe health and safety regulations.
0131.4.4 Identify legal requirements and common laws and legal documentation of a successful business operation.

Standard 5: Marketing and Sales Management (0131.S.5)
Students will:

- develop a marketing and sales plan.

Marketing and Sales Management Objectives
Students will:
0131.5.1 Develop and maintain a marketing strategy.
0131.5.2 Explain methods of advertising.
0131.5.3 Identify sources of information in using marketing research.
0131.5.4 Demonstrate successful marketing techniques.

Standard 6: Financial Management (0131.S.6)
Students will:
- develop various financial records of an agribusiness.

Financial Management Objectives
Students will:
0131.6.1 Use computers in maintaining business documents and records.
0131.6.2 Use computers to make sales and business projections.
0131.6.3 Prepare sales literature and advertisements.

Standard 7: Technology Applications in Agribusiness (0131.S.7)
Students will:
- apply technology to investigate real-world problems.

Technology Applications in Agribusiness Objectives
Students will:
0131.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0131.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0131.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0131.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 8: Process/Workplace Skills in Agribusiness (0131.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:
0131.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0131.8.2 Explore careers available in agribusiness.
0131.8.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0131.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0131.8.5 Demonstrate correct language usage in all oral and written work.
0131.8.6 Perform effectively in both leadership and non-leadership roles.
0131.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0131.8.8 Participate as a team member to complete a variety of assignments.

Agricultural Biotechnology

This course is designed to provide knowledge, skills and competencies regarding the application of biotechnology to agriscience. The course establishes a basic understanding of biotechnology, genetics, and agricultural applications and explores related careers.

Standard 1: Orientation to Biotechnology (0132.S.1)
Students will:

- research application of biotechnology in agriscience.

Biotechnology Objectives
Students will:

0132.1.1 Investigate biotechnology and its applications to agriscience.
0132.1.2 Research the biotechnology industry and make predictions regarding future uses in agriscience and the impact on the industry and consumer.

Standard 2: Genetics and Genetic Engineering (0132.S.2)
Students will:

- describe genetic engineering.

Genetics and Genetic Engineering Objectives
Students will:

0132.2.1 Define and exhibit an understanding of basic genetic terms.
0132.2.2 Explain the concept of habitability.
0132.2.3 Compare and contrast methods of transferring genetic information.
0132.2.4 Relate the concepts of dominant and recessive genes to common heritable traits.
0132.2.5 Explain and simulate recombinant DNA procedures.
0132.2.6 Explain and perform procedures used in tissue culturing.
0132.2.7 Research emerging methods of genetic engineering.
0132.2.8 Properly and safely manipulate equipment and procedures used in performing genetic engineering tasks.

Standard 3: The Application of Biotechnology to Animal Management and Reproduction (0132.S.3)
Students will:

- apply principles of biotechnology to animal production.

Animal Management and Reproduction Objectives
Students will:

0132.3.1 Apply principles of biotechnology to animal selection.
0132.3.2 Apply principles of biotechnology to animal health.
0132.3.3 Apply principles of biotechnology to the management of animal waste.
0132.3.4 Explore the application of artificial insemination in animal science.
0132.3.5 Describe the purposes and procedures of embryo transfer.
0132.3.6 Investigate and discuss the application of biotechnology to estrus manipulation.
0132.3.7 Explore developments in biotechnology regarding gender selection.

Standard 4: The Application of Biotechnology to Plant Propagation, Growth and Development (0132.S.4)
Students will:

- apply principles of biotechnology to plant production.

Plant Propagation, Growth and Development Objectives
Students will:

0132.4.1 Design, conduct, evaluate and revise experiments related to the application of biotechnology to both sexual and asexual plant propagation.
0132.4.2 Perform various tissue culturing techniques.
0132.4.3 Discuss the stages of plant growth and investigate and analyze alterations in plant growth as a result of biotechnology.
0132.4.4 Evaluate the impact of biotechnology on making plants more resistant to insects, diseases and frost.

Standard 5: Laboratory Investigation (0132.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0132.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0132.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0132.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0132.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Ethical Questions Created by Biotechnology (0132.S.6)
Students will:

- demonstrate an understanding of ethical issues associated with biotechnology.

Ethical Questions Created by Biotechnology Objectives
Students will:

0132.6.1 Examine ethical questions raised by biotechnology.
0132.6.2 Distinguish the difference between fact and opinion.

Standard 7: Leadership Development for the Biotechnology Industry (0132.S.7)
Students will:

- research and debate issues in biotechnology.

Biotechnology Industry Objectives
Students will:

0132.7.1 Obtain current information from printed sources and the Internet concerning biotechnology and evaluate for accuracy.
0132.7.2 Debate biotechnology issues.

Standard 8: Technology Applications (0132.S.8)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0132.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural biotechnology.
- Locate, evaluate, and collect information from a variety of sources related to agricultural biotechnology.
- Develop positive attitudes toward technology uses that support lifelong learning,

collaboration, personal pursuits, and productivity.

0132.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0132.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural biotechnology.

0132.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural biotechnology.

Standard 9: Process/Workplace Skills (0132.S.9)

Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives

Students will:

0132.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0132.9.2 Explore careers available in agricultural biotechnology.

0132.9.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural biotechnology.

0132.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0132.9.5 Demonstrate correct language usage in all oral and written work.

0132.9.6 Perform effectively in both leadership and non-leadership roles.

0132.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0132.9.8 Participate as a team member to complete a variety of assignments.

Agricultural Cooperative Education

This course is designed for seniors in agricultural education classes. Students must be their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and receive school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. This course will give students experience in a potential agricultural career.

- **Standard 1: Orientation (0133.S.1)**

Students will:

- prepare for employment

- **Orientation Objectives**

Students will:

0133.1.1 Determine areas of major interest in agriculture (production, agribusiness, entrepreneurship).
0133.1.2 Complete required information sheet and papers for program.
0133.1.3 Identify required policies.
0133.1.4 Establish experience program record-book procedures.
0133.1.5 Establish an appropriate training program and evaluation procedures.

- **Standard 2: Interpersonal Skill Development (0133.S.2)**

Students will:

- develop skills necessary to maintain employment.

- **Interpersonal Skill Development Objectives**

Students will:

0133.2.1 Develop an understanding of employer/employee relationships.
0133.2.2 Establish job-site ethics.
0133.2.3 Describe appropriate dress, etiquette and health habits.
0133.2.4 Determine job skills and responsibilities.
0133.2.5 Budget time effectively for job completion.
0133.2.6 Develop leadership and decision-making skills.
0133.2.7 Demonstrate a courteous attitude to customers, employers and fellow employees.
0133.2.8 Display willingness to learn new techniques and follow directions.

- **Standard 3: Job Site Safety Skills (0133.S.3)**

Students will:

- demonstrate a safety "attitude."

- **Job Site Safety Skills Objectives**

Students will:

0133.3.1 Establish a safe working environment.
0133.3.2 Obtain appropriate training from supervisor using acceptable procedures.
0133.3.3 Identify procedures for reporting safety violations.
0133.3.4 Identify the location of first aid kits, emergency phone numbers and exits.
0133.3.5 Demonstrate proper use of equipment.

- **Standard 4: Career Awareness and Employment Skills (0133.S.4)**

Students will:

- develop documents and skills to obtain employment.

- **Career Awareness and Employment Skills Objectives**

Students will:

0133.4.1 Identify areas of potential career interests.
0133.4.2 Determine contents of job application and complete a letter of application.
0133.4.3 Compose an appropriate job resume.
0133.4.4 Demonstrate job-interviewing skills.
0133.4.5 Identify methods to locate potential jobs.

- **Standard 5: Technology Applications (0133.S.5)**

Students will:

- apply technology to investigate real-world problems.

- **Technology Applications Objectives**

Students will:

0133.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0133.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0133.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0133.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

- **Standard 6: Process/Workplace Skills in Agribusiness (0133.S.6)**

Students will:

- demonstrate personal and group workplace skills.

- **Process/Workplace Skills in Agribusiness Objectives**

Students will:

0133.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0133.6.2 Explore careers available in agribusiness.
0133.6.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0133.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0133.6.5 Demonstrate correct language usage in all oral and written work.
0133.6.6 Perform effectively in both leadership and non-leadership roles.
0133.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0133.6.8 Participate as a team member to complete a variety of assignments.

- **Standard 7: Lab Investigation (0133.S.7)**

Students will:

- safely conduct laboratory investigations and exploratory learning.

- **Lab Investigation Objectives**

Students will:

0133.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0133.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0133.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0133.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

**Credit varies according to school-release time for placement. In most cases, the program will involve 2 hours/3 credits.*

Agricultural Experience Program

Students enrolled in agricultural education courses have the unique opportunity for experiential learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course code provides county school systems the vehicle whereby credit can be awarded for such individual student agricultural experiences occurring as an outgrowth from other agricultural education courses.

Standard 1: Selecting Supervised Agricultural Experience Program (0134.S.1)
Students will:

- Identify and investigate appropriate enterprises for SAE.

Supervised Agricultural Experience Program (SAE) Objectives
Students will:

0134.1.1 Define and explain the meaning and purpose of SAE.
0134.1.2 Complete a personal interest and resource inventory to identify an appropriate potential SAE.
0134.1.3 Explore and become engaged in appropriate agricultural enterprises through placement and/or entrepreneurship.

Standard 2: Maintaining Supervised Agricultural Experience Program Records (0134.S.2)
Students will:

- accurately maintain SAE records.

Supervised Agricultural Experience Program Records Objectives
Students will:

0134.2.1 Explain the types of records utilized in agricultural enterprises.
0134.2.2 Define and demonstrate the use of net worth statements, inventories, income and expense logs and other pertinent financial records.
0134.2.3 Maintain neat and accurate records for individual SAEs.

Standard 3: Evaluating and Improving Supervised Agriculture Experience Program (0134.S.3)
Students will:

- summarize and evaluate progress in individual SAEs.

Evaluating and Improving Supervised Agriculture Experience Program Objectives
Students will:

0134.3.1 Summarize financial records to determine net income from the SAE.
0134.3.2 Calculate efficiency factors related to individual SAEs.
0134.3.3 Explore opportunities for SAE expansion and/or improvement.
0134.3.4 Research and examine career opportunities related to individual SAEs.

Agriscience 11

This area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, and leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Agricultural Buildings And Equipment (0135.S.1)
Students will:

- apply agricultural mechanical skills in solving agriscience problems.

Agricultural Buildings and Equipment Objectives
Students will:

0135.1.1 Compare and contrast fencing systems, materials, tools and management practices.
0135.1.2 Analyze and discuss types of agricultural buildings and related construction.
0135.1.3 Interpret agricultural equipment service manuals and maintenance schedules.
0135.1.4 Perform basic transit procedures.

Standard 2: Pesticide Safety and Management (0135.S.2)
Students will:

- describe basic pesticide safety.

Pesticide Safety and Management Objectives
Students will:

0135.2.1 Investigate and discuss pesticide types and pest control.
0135.2.2 Examine control methods, chemical formulation and equipment used to control pests in the greenhouse.
0135.2.3 Identify information on a pesticide label.
0135.2.4 Explore the safe handling and disposal of pesticides.
0135.2.5 Identify and perform the steps in calibrating a sprayer.
0135.2.6 Research integrated pest management.

Standard 3: Health and Care of Farm Related Animals (0135.S.3)
Students will:

- explain how to maintain animal health.

Health and Care of Farm Related Animals Objectives
Students will:

0135.3.1 Investigate and discuss the symptoms of unhealthy animals.
0135.3.2 Identify and diagnose symptoms of disease and parasites.
0135.3.3 Analyze the treatment and prevention of animal disease.
0135.3.4 Utilize techniques in administering medicine and immunizing.
0135.3.5 Examine the treatment and prevention of animal parasites.
0135.3.6 Identify and illustrate the methods for administering medicines to animals.
0135.3.7 Design and utilize a herd health program.
0135.3.8 Differentiate between animal welfare and animal rights.

Standard 4: Work-based Experiential Programs (Supervised Agricultural Experience Programs) (0135.S.4)
Students will:

- conduct work-based experience programs.

Work-based Experiential Programs Objectives
Students will:
0135.4.1 Complete and summarize record book enterprises related to students Supervised Agricultural Experience Program.
0135.4.2 Calculate efficiency factors related to students Supervised Agricultural Experience Program.

Standard 5: Managing Farm Woodlots (0135.S.5)
Students will:
- describe farm woodlot management.

Managing Farm Woodlots Objectives
Students will:
0135.5.1 Compare and contrast the methods of identifying trees.
0135.5.2 Identify trees common to West Virginia.
0135.5.3 Evaluate major forest type and primary uses.
0135.5.4 Measure tree height and diameter.
0135.5.5 Identify and utilize units of measurement (mile, rod, chair & acre).
0135.5.6 Calculate the number of acres in a timber tract.
0135.5.7 Examine the habitat necessary for wildlife.

Standard 6: Laboratory Investigations/Hands-on Learning (0135.S.6)
Students will:
- safely conduct laboratory investigation and exploratory learning.

Laboratory Investigations/hands-on Learning Objectives
Students will:
0135.6.1 Engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0135.6.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0135.6.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0135.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 7: Leadership Development in Agriscience (0135.S.7)
Students will:
- display leadership skills in Agriscience

Leadership Development in Agriscience Objectives
Students will:
0135.7.1 Conduct meetings using parliamentary law.
0135.7.2 Serve as a small group team leader.
0135.7.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0135.7.4 Engage in committees and leadership development activities.
0135.7.5 Model and exhibit community service.

Standard 8: Principles of Safety (0135.S.8)
Students will:
- demonstrate principles of safety.

Principles of Safety Objectives
Students will:
0135.8.1 Wear appropriate protective gear.
0135.8.2 Maintain a safe working environment.
0135.8.3 Identify and engage in safety practices on the farm and in the work place.

Standard 9: Technology Applications (0135.S.9)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0135.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agriscience.
- Locate, evaluate, and collect information from a variety of sources related to agriscience.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0135.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0135.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agriscience.

0135.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agriscience.

Standard 10: Process/Workplace Skills (0135.S.10)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0135.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0135.10.2 Explore careers available in agriscience.

0135.10.3 Use a variety of sources to investigate the educational requirements of various careers in agriscience.

0135.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0135.10.5 Demonstrate correct language usage in all oral and written work.

0135.10.6 Perform effectively in both leadership and non-leadership roles.

0135.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0135.10.8 Participate as a team member to complete a variety of assignments.

Agriscience 12

The area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Appling Agriculture Mechanic Skills (0136.S.1)
Students will:

- apply agriculture mechanic skills in solving problems in agriscience.

Appling Agriculture Mechanic Skills Objectives
Students will:

0136.1.1 Tune-up and perform maintenance procedures on agricultural engine driven machines.
0136.1.2 Perform basic electrical wiring skills.
0136.1.3 Adjust and maintain hay equipment.
0136.1.4 Form, mix, pour and finish concrete.

Standard 2: Land Use Capabilities and Soil Conservation (0136.S.2)
Students will:

- demonstrate land use capabilities and soil conservation in agriscience.

Land Use Capabilities and Soil Conservation Objectives
Students will:

0136.2.1 Evaluate and classify soils according to land use factors.
0136.2.2 Define and determine physical properties of soil.
0136.2.3 Recommend land use and soil conservation practices.
0136.2.4 Test soil and analyze fertility recommendations.
0136.2.5 Explain the function and management of soil pH.
0136.2.6 Describe the process of soil testing.
0136.2.7 Interpret and apply data generated by soil testing.

Standard 3: Landscape Design and Turfgrass Management (0136.S.3)
Students will:

- engage in activities in landscape design and turfgrass management.

Landscape Design and Turfgrass Management Objectives
Students will:

0136.3.1 Identify turfgrass species, purposes and desired locations.
0136.3.2 Explain steps for turfgrass establishment.
0136.3.3 Calculate fertilizer application rates.
0136.3.4 Identify common turf insects, weeds, diseases and biological control.
0136.3.5 Identify ornamental tree and shrubs.
0136.3.6 Select trees and shrubs for appropriate landscape use.
0136.3.7 Install and maintain landscape plant materials.

Standard 4: Animal Reproduction (0136.S.4)
Students will:

- display a working knowledge of animal reproduction.

Animal Reproduction Objectives
Students will:
0136.4.1 Describe genetic principles of animal breeding.
0136.4.2 Identify parts of the male and female reproductive tracts.
0136.4.3 Explain the estrus cycle and gestation period of farm animals.
0136.4.4 Describe techniques of artificial insemination, embryo transplant and pregnancy testing.
0136.4.5 Select breeding stock using performance test data.
0136.4.6 Identify biotechnology implications for animal production.

Standard 5: Farm and Agribusiness Financing (0136.S.5)
Students will:
- engage in activities to augment the understanding of farm and agribusiness financing.

Farm and Agribusiness Financing Objectives
Students will:
0136.5.1 Describe the economic principles of supply and demand.
0136.5.2 Identify sources of credit.
0136.5.3 Calculate simple interest on a loan.
0136.5.4 Explain income tax requirements.
0136.5.5 Identify the functions of government agricultural agencies and programs.
0136.5.6 Describe the steps in planning an agribusiness.

Standard 6: Employment Skills (0136.S.6)
Students will:
- conduct activities designed to enhance employment skills.

Employment Skills Objectives
Students will:
0136.6.1 Identify personal traits necessary to secure and maintain a job.
0136.6.2 Initiate a job search.
0136.6.3 Develop a resume.
0136.6.4 Complete a job application.
0136.6.5 Participate in simulated job interviews.

Standard 7: Work Based Experience (0136.S.7)
Students will:
- conduct activities designed to enhance employment skills.

Work Based Experience Objectives
Students will:
0136.7.1 Complete and summarize record book enterprises related to students supervised agricultural experience program.
0136.7.2 Calculate efficiency factors related to students supervised agricultural experience program.

Standard 8: Computer Application (0136.S.8)
Students will:
- engage in computer applications in agriscience.

Computer Application Objectives
Students will:
0136.8.1 Use computer resources to solve problems related to work-based experience programs.

Standard 9: Leadership in Agriscience (0136.S.9)
Students will:

- develop leadership skills in agriscience.

Leadership in Agriscience Objectives
Students will:
0136.9.1 Conduct meetings using parliamentary law.
0136.9.2 Serve as a small group team leader.
0136.9.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0136.9.4 Participate in committee and leadership development activities.
0136.9.5 Participate in community services.

Standard 10: Safety (0136.S.10)
Students will:
- demonstrate principles of safety.

Safety Objectives
Students will:
0136.9.1 Wear appropriate protective gear.
0136.9.2 Maintain a safe working environment.
0136.9.3 Identify safety practices on the farm and in the work place.

Animal And Veterinary Science – Large Animals

This course is designed to give students advanced knowledge of veterinary science, which includes the study of large farm animals (horses, cattle, sheep, goats and swine). This course will provide an understanding of breeds, animal health, nutrition, anatomy and physiology, training, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of large animals and their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0137.S.1)
Students will participate in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0137.1.1 Participate in committee and leadership development activities associated with FFA.
0137.1.2 Complete and summarize records of SAE Program and health program on individual animals.
0137.1.3 Shadow appropriate career opportunities in Veterinary Medicine.
0137.1.4 Initiate a job search and complete application for entry into college level programs in Veterinary Science.
0137.1.5 Develop communication skills through prepared and extemporaneous speaking.

Standard 2: History And Selection of Farm Animals (0137.S.2)
Students will examine the history and selection of farm animals.

History and Selection of Farm Animals Objectives
Students will:
0137.2.1 Trace the history of domestic farm animals and relate it to human and animal health.
0137.2.2 Classify farm animals according to purposes/use.
0137.2.3 Identify breeds of large animals (horses, cattle, sheep, goats, swine).
0137.2.4 Relate the characteristics of breeds to methods of selection.

Standard 3: Handling and Restraint (0137.S.3)
Students will demonstrate safe methods for handling and restraining farm animals.

Handling and Restraint Objectives
Students will:
0137.3.1 Identify and use tools related to handling and restraint of large animals.
0137.3.2 Demonstrate methods of techniques used in restraint of large animals.
0137.3.3 Utilize basic commands and animal behavior methods to control animals.
0137.3.4 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0137.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0137.4.1 Utilize safety practices in grooming and clipping large animals.
0137.4.2 Identify and utilize tools pertinent to the grooming, brushing and bathing of large animals.
0137.4.3 Demonstrate the ability to follow post-operative care and management of animals.

Standard 5: Anatomy and Physiology (0137.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:

0137.5.1 Identify the major parts and examine the functions of the skeletal system.
0137.5.2 Identify the major parts and examine the functions of the muscular system.
0137.5.3 Identify the major parts and examine the functions of the nervous system.
0137.5.4 Identify the major parts and examine the functions of the endocrine system.
0137.5.5 Identify the major parts and examine the functions of the respiratory system.
0137.5.6 Identify the major parts and examine the functions of the circulatory system.
0137.5.7 Identify the major parts and examine the functions of the reproductive system.
0137.5.8 Identify the major parts and examine the functions of the excretory system.
0137.5.9 Identify the major parts and examine the functions of the digestive system.
0137.5.10 Compare and contrast ruminant and monogastric systems.
0137.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0137.S.6)
Students will display a working knowledge of managing animal health.

Animal Health and Management Objectives
Students will:

0137.6.1 Determine the type of care and housing facilities needed for large animals.
0137.6.2 Examine mechanical injury and perform basic first aid requirements for large farm animals.
0137.6.3 Identify signs/symptoms of disease, as well as prevention and treatment of large animals.
0137.6.4 Utilize techniques in administering medicine and immunizing large farm animals.
0137.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies used with a large farm animal.
0137.6.6 Recognize relationships between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0137.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0137.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0137.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0137.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0137.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0137.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis of large animals.
0137.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic and field operations.
0137.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0137.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:

0137.8.1 Define, discuss and utilize terms associated with large animal nutrition.
0137.8.2 List and describe the basic nutrients and their functions.

0137.8.3 Analyze feed labels and determine the nutritional value of feeds and feedstuffs.
0137.8.4 Recognize signs of nutritional deficiencies.
0137.8.5 Analyze feeding and care requirements for maintaining pregnancy of large animals.

Standard 9: Marketing
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0137.9.1 Record data and complete information required by law and regulations in the management of large animals.
0137.9.2 Calculate and analyze cost of owning and operating a large animal health clinic.

Standard 10: Technology Applications (0137.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0137.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0137.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0137.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0137.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0137.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0137.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0137.11.2 Explore careers available in animal science.
0137.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0137.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0137.11.5 Demonstrate correct language usage in all oral and written work.
0137.11.6 Perform effectively in both leadership and non-leadership roles.
0137.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0137.11.8 Participate as a team member to complete a variety of assignments.

Animal And Veterinary Science – Small Animals

This agricultural science course is designed to give students a working knowledge of veterinary science through the study of many animals including dogs, cats, birds, reptiles and other pets. This course will provide an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of animals along with their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0138.S.1)
Students will become involved in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0138.1.1 Demonstrate an awareness of FFA and its components.
0138.1.2 Utilize record-keeping skills in work-based experience programs.
0138.1.3 Research appropriate career opportunities in veterinary medicine.
0138.1.4 Draft a resume, fill out a job application, demonstrate job seek/keep and computer skills.
0138.1.5 Develop and exhibit personal relation and communication skills.
0138.1.6 Demonstrate an awareness of employment and animal welfare ethics.

Standard 2: History and Selection of Small Animals (0138.S.2)
Students will examine the history and selection of small animals.

History and Selection of Small Animals Objectives
Students will:
0138.2.1 Trace the history of domestic animals and relate it to human and animal health.
0138.2.2 Classify small animals according to purposes/use.
0138.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0138.2.4 Examine the characteristics of small animals and incorporate into laboratory experimentation and disease evaluation.

Standard 3: Handling and Restraint (0138.S.3)
Students will demonstrate safe methods for handling and restraining small animals.

Handling and Restraint Objectives
Students will:
0138.3.1 Identify and use tools related to handling and restraint of small animals.
0138.3.2 Demonstrate methods and techniques used in restraint of small animals.
0138.3.3 Develop a basic understanding of animal behavior.
0138.3.4 Demonstrate the ability to follow post-operative care and management of animals.
0138.3.5 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0138.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0138.4.1 Utilize safety practices in grooming and clipping small animals.
0138.4.2 Identify and use animal grooming tools.
0138.4.3 Demonstrate an awareness of grooming practices (bathing, clipping, nail trimming, combing/brushing).
0138.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0138.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:
0138.5.1 Identify the major parts and examine the functions of the skeletal system.
0138.5.2 Identify the major parts and examine the functions of the muscular system.
0138.5.3 Identify the major parts and examine the functions of the nervous system.
0138.5.4 Identify the major parts and examine the functions of the endocrine system.
0138.5.5 Identify the major parts and examine the functions of the respiratory system.
0138.5.6 Identify the major parts and examine the functions of the circulatory system.
0138.5.7 Identify the major parts and examine the functions of the reproductive system.
0138.5.8 Identify the major parts and examine the functions of the excretory system.
0138.5.9 Identify the major parts and examine the functions of the digestive system.
0138.5.10 Compare and contrast ruminant and monogastric systems.
0138.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0138.S.6)
Students will describe the principles of managing animal health.

Animal Health and Management Objectives
Students will:
0138.6.1 Determine the type of care and housing facilities needed.
0138.6.2 Examine mechanical injury and perform basic first aid.
0138.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0138.6.4 Utilize techniques in administering medicine and immunizing.
0138.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies.
0138.6.6 Recognize relationship between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0138.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0138.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0138.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0138.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0138.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0138.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis.
0138.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic.
0138.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0138.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:
0138.8.1 Define, discuss and utilize terms associated with nutrition.

0138.8.2 List and describe the basic nutrients and their functions.
0138.8.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0138.8.4 Recognize signs of nutritional deficiencies.
0138.8.5 Analyze feeding and care requirements throughout life cycle and pregnancy.

Standard 9: Marketing (0138.S.9)
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0138.9.1 Research types of laws, regulations and licenses as needed in a veterinarian clinic.
0138.9.2 Calculate and analyze costs of owning and operating an animal care business.

Standard 10: Technology Applications (0138.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0138.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0138.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0138.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0138.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0138.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0138.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0138.11.2 Explore careers available in animal science.
0138.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0138.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0138.11.5 Demonstrate correct language usage in all oral and written work.
0138.11.6 Perform effectively in both leadership and non-leadership roles.
0138.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0138.11.8 Participate as a team member to complete a variety of assignments.

Animal Processing

This course is designed to provide students with basic knowledge and skills in meat processing occupations. Students will be able to exhibit these skills in the areas of sanitation and safety, slaughtering, processing and retailing, job seek/keep skills and microcomputer applications.

Standard 1: Leadership (0139.S.1)
Students will:

- demonstrate skills necessary to be employed.

Leadership Objectives
Students will:

0139.1.1 Participate in FFA activities.
0139.1.2 Write, deliver and evaluate a speech and/or oral presentation.
0139.1.3 Explore careers in processing.
0139.1.4 Determine appropriate job seek/keep skills.
0139.1.5 Demonstrate knowledge of ethical conduct in the workplace.

Standard 2: Sanitation/Safety (0139.S.2)
Students will:

- safely handle meat products.

Sanitation/Safety Objectives
Students will:

0139.2.1 List USDA sanitary practices relating to personal hygiene, sanitization of equipment and maintenance of facilities.
0139.2.2 Explain safe methods of handling tools, equipment and livestock in processing and slaughtering.
0139.2.3 Identify proper temperatures and time periods for storage and handling of fresh and frozen meat and meat products.
0139.2.4 Identify proper storage and handling techniques for consumables and by-products.

Standard 3: Slaughtering (0139.S.3)
Students will:

- demonstrate slaughtering procedures.

Slaughtering Objectives
Students will:

0139.3.1 List common breeds, USDA classes and grades of live cattle, sheep and swine.
0139.3.2 Demonstrate how to yield and quality grade hanging carcasses.
0139.3.3 Describe humane processes for stunning and bleeding animals.
0139.3.4 Properly skin, eviscerate and split carcasses of cattle.
0139.3.5 Skin or scald and scrape, eviscerate and split pork carcasses.
0139.3.6 Skin, fist and eviscerate lamb and mutton carcasses.
0139.3.7 Compute dressing percentage, percent shrink, return on offal and slaughter cost.
0139.3.8 Properly weigh and mark carcasses.

Standard 4: Processing (0139.S.4)
Students will:

- prepare retail meat products.

Processing Objectives
Students will:

0139.4.1 Identify primal cuts of beef, pork and lamb.
0139.4.2 Break carcasses into primal cuts.
0139.4.3 Identify retail cuts of beef, pork and lamb.
0139.4.4 Identify common boneless cuts of boxed beef and pork.
0139.4.5 Cut primal cuts and boxed products into various retail cuts.
0139.4.6 List methods of value added processing (grinding, curing, smoking, pre-cooking) and packaging of beef pork and lamb

Standard 5: Retailing (0139.S.5)
Students will:

- utilize merchandise product for customers.

Retailing Objectives
Students will:
0139.5.1 Prepare attractive displays of meat and meat products.
0139.5.2 Demonstrate knowledge and skills in customer relations.
0139.5.3 Exhibit an understanding of retail value; trim loss, shelf life and seasonal demand as related to pricing of products.

Standard 6: Technology Applications (0139.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0139.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal processing.
- Locate, evaluate, and collect information from a variety of sources related to animal processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0139.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0139.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal processing.
0139.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal processing.

Standard 7: Process/Workplace Skills (0139.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0139.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0139.7.2 Explore careers available in animal processing.
0139.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0139.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0139.7.5 Demonstrate correct language usage in all oral and written work.
0139.7.6 Perform effectively in both leadership and non-leadership roles.

0139.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0139.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0139.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0139.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0139.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0139.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0139.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Animal Science And Production

This agriculture science course is designed to give students a working knowledge of the commercial livestock industry, which includes beef, sheep, swine, horses, goats, dairy and poultry. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection, and economic and marketing principles related to employment. Students will develop a working knowledge of land use and livestock production to maintain an economical level of production. Upon completion of this course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0140.S.1)
Students will develop leadership skills.

Leadership Objectives
Students will:
0140.1.1 Describe FFA and its components.
0140.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0140.1.3 Identify careers in the animal industry.
0140.1.4 Identify employability skills.
0140.1.5 Develop personal relation and communication skills.
0140.1.6 Describe employment and animal welfare ethics.

Standard 2: History and Selection of Animals (0140.S.2)
Students will provide background information and describe characteristics of animals.

History and Selection of Animals Objectives
Students will:
0140.2.1 Relate the history of domestic animals to modern animal production.
0140.2.2 Describe and classify small animals according to purpose/use.
0140.2.3 Identify breeds of animals.
0140.2.4 Relate the characteristics of breeds to methods of selection (beef, sheep, swine, horses, goats, dairy and poultry).

Standard 3: Handling and Restraint (0140.S.3)
Students will demonstrate safe handling and restraining techniques.

Handling and Restraint Objectives
Students will:
0140.3.1 Identify and use tools related to handling/restraint of animals.
0140.3.2 Identify methods and techniques used in modern husbandry practices.
0140.3.3 Describe techniques in grooming and showing livestock.
0140.3.4 Describe safety practices for managing and handling livestock.

Standard 4: Animal Health and Management (0140.S.4)
Students will demonstrate animal health and management skills.

Animal Health and Management Objectives
Students will:
0140.4.1 Determine the type of care and housing facilities needed for livestock.
0140.4.2 Describe mechanical injury and treatment requirements.
0140.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0140.4.4 Utilize techniques in administering medicine and immunizing.
0140.4.5 Design and utilize a herd health program in livestock production.

Standard 5: Anatomy and Physiology (0140.S.5)
Students will utilize the fundamentals of anatomy and physiology in the commercial production of livestock.

Anatomy and Physiology Objectives
Students will:

0140.5.1 Identify the major parts and functions of the anatomy of various types of livestock.
0140.5.2 Identify the major parts and functions of the digestive system.
0140.5.3 Identify the major parts and functions of the reproductive system.
0140.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to livestock management.
0140.5.5 Identify and explain modern livestock breeding techniques.
0140.5.6 Analyze and explain data utilizing genotypic information to form a superior livestock program.

Standard 6: Nutrition (0140.S.6)
Students will describe the role of nutrition in animal production.

Nutrition Objectives
Students will:

0140.6.1 Define terms associated with nutrition.
0140.6.2 List and describe the basic nutrients and their functions.
0140.6.3 Balance rations and determine the nutritional value of feeds and feedstuffs.
0140.6.4 Identify signs of nutritional deficiencies.
0140.6.5 Identify feeding and care requirements throughout life cycle and pregnancy of livestock.
0140.6.6 Identify and design various forage management programs for economical livestock production

Standard 7: Marketing (0140.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:

0140.7.1 Research and study various livestock marketing techniques.
0140.7.2 Identify transportation and safety methods for livestock handling.
0140.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0140.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Technology Applications (0140.S.8)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0140.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science and production.
- Locate, evaluate, and collect information from a variety of sources related to animal science and production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0140.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0140.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal science and production.
0140.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science and production.

Standard 9: Process/Workplace Skills (0140.S.9)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0140.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0140.9.2 Explore careers available in animal science.
0140.9.3 Use a variety of sources to investigate the educational requirements of various careers in animal and science production.
0140.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0140.9.5 Demonstrate correct language usage in all oral and written work.
0140.9.6 Perform effectively in both leadership and non-leadership roles.
0140.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0140.9.8 Participate as a team member to complete a variety of assignments.

Standard 10: Laboratory Investigation (0140.10)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0140.10.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0140.10.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0140.10.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0140.10.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Aquaculture

This course of study is designed to provide experiential knowledge, skills and entrepreneurial competencies needed to enter various occupations in aquaculture and other scientific fields within aquaculture. This course integrates curricula of biology, physics, earth science and chemistry in producing aquatic species.

Standard 1: Orientation to the Aquaculture Industry (0141.S.1)
Students will examine the role of aquaculture in state, national and international economies.

Aquaculture Industry Objectives
Students will:
0141.1.1 Explore the role of aquaculture in the past, present and future.
0141.1.2 Relate the importance of aquaculture to state, national, and international economies.
0141.1.3 Examine employment trends and cycles related to aquaculture.

Standard 2: Leadership Development in Aquaculture (0141.S.2)
Students will participate in activities to develop leadership in the aquaculture industry.

Leadership Development in Aquaculture Objectives
Students will:
0141.2.1 Present prepared and extemporaneous speeches on issues concerning the aquaculture industry.
0141.2.2 Participate in community service.
0141.2.3 Demonstrate problem solving and decision making skills.
0141.2.4 Conduct meetings using parliamentary law.

Standard 3: Production Systems in Aquaculture (0141.S.3)
Students will design, establish and maintain aquaculture systems.

Production Systems in Aquaculture Objectives
Students will:
0141.3.1 Identify components of an aquaculture system and calculate water volumes, flow rates, solubility, density, etc.
0141.3.2 Research appropriate species for closed and flow-through systems.
0141.3.3 Explain basic animal management requirements for warm and cold-water species.
0141.3.4 Investigate and discuss factors that influence site selection.
0141.3.5 Using a bill of materials, design and/or construct a closed system.

Standard 4: Developing Work-based Experiential Programs (Supervised Agricultural Experience Programs) in Aquaculture (0141.S.4)
Students will explore entrepreneurial and employment opportunities in aquaculture.

Aquaculture Objectives
Students will:
0141.4.1 Define and explain the different supervised experience programs that are available in aquaculture.
0141.4.2 Prepare a business plan for implementation.
0141.4.3 Explore careers associated within the aquaculture industry.
0141.4.4 Create and demonstrate the key aspects of a marketing plan.
0141.4.5 Demonstrate different ways a fish can be processed.

Standard 5: Anatomy and Physiology (0141.S.5)
Students will identify and explain functions and disorders of body systems in aquatic species.

Anatomy and Physiology Objectives
Students will:
0141.5.1 Identify and explain the functions of body systems in aquatic species.
0141.5.2 Explain the process of spawning.
0141.5.3 Distinguish common fish health problems in closed systems.
0141.5.4 Investigate the role of breeding and selection in genetic improvement.

Standard 6: Nutrition (0141.S.6)
Students will describe nutrition affecting aquatic species.

Nutrition Objectives
Students will:
0141.6.1 Identify and compare common types of feed.
0141.6.2 Calculate feed rates.
0141.6.3 Calculate feed conversion.
0141.6.4 Calculate feed efficiency.
0141.6.5 Describe the nutritional needs of fish at different stages of growth.

Standard 7: Water Chemistry and its Relationship to Aquaculture (0141.S.7)
Students will perform water quality procedures and rebate results to performance of aquatic species.

Water Chemistry Objectives
Students will:
0141.7.1 Explain water quality parameters.- pH, Oxygen level, nitrates, nitrates, etc.
0141.7.2 Demonstrate sampling and testing techniques.
0141.7.3 Design a wastewater management system.

Standard 8: Safety in Aquaculture Laboratories (0141.S.8)
Students will demonstrate principles of safety in aquaculture.

Aquaculture Laboratories Objectives
Students will:
0141.8.1 Maintain a safe working environment in the aquaculture laboratory.
0141.8.2 Demonstrate and apply laboratory safety in aquaculture settings.

Standard 9: Laboratory Practices and Procedures/Hands-on Learning (0141.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Practices and Procedures Objectives
Students will:
0141.9.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0141.9.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0141.9.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0141.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 10: Technology Applications in Aquaculture (0141.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications in Aquaculture Objectives
Students will:

0141.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in aquaculture.
- Locate, evaluate, and collect information from a variety of sources related to aquaculture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0141.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.

0141.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to aquaculture.

0141.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of aquaculture.

Standard 10: Process/workplace Skills and Aquaculture (0141.S.10)
Students will demonstrate personal and group workplace skills.

Workplace Skills Objectives
Students will:

0141.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0141.11.2 Explore careers available in aquaculture.

0141.11.3 Use a variety of sources to investigate the educational requirements of various careers in aquaculture and related sciences.

0141.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0141.11.5 Demonstrate correct language usage in all oral and written work.

0141.11.6 Perform effectively in both leadership and non-leadership roles.

0141.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0141.11.8 Participate as a team member to complete a variety of assignments.

Computers In Agriculture

This course is designed to expose students to computer programming, software and applications and graphical and electronic information technology as it relates to the agriculture industry. Students will be able to utilize computers and related technology in desktop publishing, record-keeping, agricultural production, agribusiness and telecommunications. Students will also relate these applications to potential occupations within the computer technology field.

Standard 1: Word Processing and Communications (0142.S.1)
Students will demonstrate skills involving word processing in agriculture.

Word Processing and Communications Objectives
Students will:
0142.1.1 Prepare documents using word processing software.
0142.1.2 Utilize keyboarding skills for preparing reports and letters.
0142.1.3 Improve writing skills through the use of grammatical aids.
0142.1.4 Utilize data management systems.

Standard 2: Spreadsheet Applications (0142.S.2)
Students will use agricultural data in computer-based spreadsheets.

Spreadsheet Applications Objectives
Students will:
0142.2.1 Use software programs to integrate mathematical functions into agricultural production and agribusiness systems.
0142.2.2 Manipulate numerical data as it relates to cost benefit analysis.
0142.2.3 Prepare budgets, financial statements, income reports and production records.
0142.2.4 Complete applications relating to work-based experiences (Supervised Agricultural Experience Programs).

Standard 3: Graphical Presentations (0142.S.3)
Students will utilize graphical presentation software.

Graphical Presentations Objectives
Students will:
0142.3.1 Utilize graphic based software for presentations.
0142.3.2 Prepare visual aids for communicative demonstrations.

Standard 4: Electronic Information Systems (0142.S.4)
Students will demonstrate skills involving electronic information systems.

Electronic Information Systems Objectives
Students will:
0142.4.1 Utilize telecommunications resources in writing documents, manipulating data and transmitting information.
0142.4.2 Retrieve data from agricultural networks.
0142.4.3 Investigate product-marketing principles using computer technology.
0142.4.4 Integrate computer technology into agricultural production systems through the use of remote control and remote sensor science.
0142.4.5 Explore Global Positioning Satellite applications in agriculture.

Standard 5: Agricultural Journalism and Desktop Publishing (0142.S.5)
Students will produce agricultural publications.

Agricultural Journalism and Desktop Publishing Objectives
Students will:

0142.5.1 Prepare newspaper and magazine articles for publishing.
0142.5.2 Manufacture flyers, programs and booklets using graphic software.
0142.5.3 Design a template for printing books, articles and programs.

Standard 6: Process/Workplace Skills (0142.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0142.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0142.6.2 Explore careers available in computer technology.
0142.6.3 Use a variety of sources to investigate the educational requirements of various careers in computer technology.
0142.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0142.6.5 Demonstrate correct language usage in all oral and written work.
0142.6.7 Perform effectively in both leadership and non-leadership roles.
0142.6.8 Evaluate information for reliability, completeness, and applicability to various assignments.
0142.6.9 Participate as a team member to complete a variety of assignments.

Environmental Technology

This class will cover various aspects of environmental science applications to prevent detrimental effects on our ecosystem. Units will include solid and hazardous waste, water purification, wastewater treatment, solid erosion control, nutrient management and environmental surveying.

Standard 1: Solid Waste (0143.S.1)
Students will identify solid waste.

Solid Waste Objectives
Students will:
0143.1.1 Analyze sources of solid waste.
0143.1.2 Examine hazards in solid waste materials and disposal.
0143.1.3 Compare and contrast methods of solid waste disposal.
0143.1.4 Explain and participate in recycling.
0143.1.5 Describe composting.
0143.1.6 Explore methods and benefits of composting.

Standard 2: Hazardous Waste (0143.S.2)
Students will identify hazardous waste materials.

Hazardous Waste Objectives
Students will:
0143.2.1 Identify types of hazardous waste.
0143.2.2 Describe ecotoxicology.
0143.2.3 Explain hazardous waste disposal.
0143.2.4 Explain safety procedures and simulate clean up of spills.

Standard 3: Water Purification (0143.S.3)
Students will identify water purification.

Water Purification Objectives
Students will:
0143.3.1 Describe the composition of water.
0143.3.2 Explain the importance of water.
0143.3.3 Identify sources of water.
0143.3.4 Investigate and discuss how water is stored and distributed.
0143.3.5 Research how water is used and managed.
0143.3.6 Name and distinguish various types of wetlands.
0143.3.7 Explore the benefits and function of wetlands.
0143.3.8 Analyze how human action affects wetlands.

Standard 4: Wastewater Treatment and Disposal (0143.S.4)
Students will identify wastewater treatments and disposals.

Wastewater Treatment and Disposal Objectives
Students will:
0143.4.1 Identify sources of wastewater.
0143.4.2 Describe hazards in wastewater.
0143.4.3 Compare and contrast ways of treating wastewater.
0143.4.4 Research the products of wastewater treatment, including the production and use of biosolids.
0143.4.5 Recognize and investigate the important biological, chemical, and biogeochemical processes in wastewater treatment.

0143.4.6 Explain the components and operation of a wastewater treatment system.

Standard 5: Soil Erosion Control (0143.S.5)
Students will identify soil erosion.

Soil Erosion Control Objectives
Students will:
0143.5.1 Identify and describe the physical properties of soil and their impact on soil erosion.
0143.5.2 Compare and contrast types of soil erosion.
0143.5.3 Illustrate soil conservation practices for urban and agricultural areas.
0143.5.4 Utilize a soil survey to make environmental decisions.
0143.5.5 Explain the best management practices to control sediment from urban areas, agriculture and forests.
0143.5.6 Examine soil erosion control devices.

Standard 6: Nutrition Management (0143.S.6)
Students will identify nutritional management of soil.

Nutrition Management Objectives
Students will:
0143.6.1 Investigate and discuss non-point source pollution.
0143.6.2 Utilize soil nutrient testing procedures to determine available nutrients.
0143.6.3 Utilize nutrient testing procedures to determine organic matter content.
0143.6.4 Complete a nutrient management plan.
0143.6.5 Calibrate a nutrient spreader for rate of application.
0143.6.6 Perform water-testing procedures and interpret results to determine impacts of non-point source pollution.

Standard 7: Environmental Surveying (0143.S.7)
Students will identify the trade of environmental surveying.

Environmental Surveying Objectives
Students will:
0143.7.1 Demonstrate basic surveying skills.
0143.7.2 Utilize topographical maps to make environmental decisions.
0143.7.3 Apply design principles to pond and wetland construction, sediment basins, and other similar structures.
0143.7.4 Identify and accurately utilize surveying equipment.

Standard 8: Leadership (0143.S.8)
Students will participate in related activities.

Leadership Objectives
Students will:
0143.8.1 Participate in WV Envirothon and other activities related to the curriculum.
0143.8.2 Utilize Internet World Wide Net to explore specialty areas in horticulture.

Standard 9: Laboratory Investigation (0143.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0143.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0143.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0143.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0143.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0143.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0143.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in environmental technology.
- Locate, evaluate, and collect information from a variety of sources related to environmental technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0143.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0143.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to environmental technology.
0143.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of environmental technology.

Standard 11: Process/Workplace Skills (0143.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0143.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0143.11.2 Explore careers available in environmental technology.
0143.11.3 Use a variety of sources to investigate the educational requirements of various careers in environmental technology.
0143.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0143.11.5 Demonstrate correct language usage in all oral and written work.
0143.11.6 Perform effectively in both leadership and non-leadership roles.
0143.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0143.11.8 Participate as a team member to complete a variety of assignments.

Food Science and Processing

This course is designed to provide students with knowledge, skills and competencies needed to enter various food science and food products processing careers. Major concepts covered are leadership, nutrition, food safety, and food products processing and marketing of food products.

Standard 1: Leadership (0144.S.1)
Students will demonstrate leadership skills.

Leadership Objectives
Students will:
0144.1.1 List food science and food products processing related careers.
0144.1.2 Participate in FFA activities.
0144.1.3 Complete a Supervised Agricultural Experience (SAE) Program.
0144.1.4 Present individual and group presentations on food products processing related topics.
0144.1.5 Conduct meetings using parliamentary law.

Standard 2: Nutrition (0144.S.2)
Students will explain basics of good nutrition and good health.

Nutrition Objectives
Students will:
0144.2.1 Identify six basic nutrients and related nutrient deficiencies.
0144.2.2 Read and interpret information on product labels.
0144.2.3 Demonstrate knowledge of food groups by classifying foods accordingly.
0144.2.4 Explain procedures involved in enhancing the nutritional value of food.
0144.2.5 Relate retail cost and nutritional value of food palatability.
0144.2.6 Demonstrate an awareness of the effects of food on physical health and well being.

Standard 3: Food Safety (0144.S.3)
Students will describe factors affecting food safety.

Food Safety Objectives
Students will:
0144.3.1 Identify common risks and safety hazards involved in storage, handling, processing and preparation of food products.
0144.3.2 Understand the influence of potable water on processing, storing and packaging food.
0144.3.3 Describe the effects of microbes on food spoilage during processing, handling, storage and food preparation.
0144.3.4 Describe FSIS and USDA inspection and grading standards relating to food products.
0144.3.5 Relate the importance of product testing to providing a safe and wholesome food supply (including drugs/hormones, pesticides and consumer quality issues.)

Standard 4: Food Products Processing (0144.S.4)
Students will explore different techniques of processing foods.

Food Products Processing Objectives
Students will:
0144.4.1 Analyze the effects of food processing techniques on the nutritional value of foods.
0144.4.2 Demonstrate food-processing techniques used in the dairy products industry. (fermentation, pasteurization and homogenization).
0144.4.3 Describe techniques used in cereal grain processing. (bleaching, grinding, milling and enriching).

0144.4.4 List processing techniques used in the meat industry. (cooking, curing, grinding).
0144.4.5 Demonstrate an awareness of food processing techniques used in the fruit and vegetable industry (canning, freezing, heating.)
0144.4.6 Dehydrate food items to produce less perishable products.
0144.4.7 Describe and demonstrate food preservation techniques.
0144.4.8 Identify bioengineered food items and describe microbiological processing techniques.

Standard 5: Marketing (0144.S.5)
Students will explore factors that influence food cost and consumption trends.

Marketing Objectives
Students will:
0144.5.1 Describe the relative cost of food in the U.S. as compared to other counties.
0144.5.2 Identify trends and cycles in food product markets.
0144.5.3 Relate pricing of products to trends and cycles in markets.
0144.5.4 Demonstrate an awareness of different packaging techniques and their effects on product quality.
0144.5.5 List transportation methods used in marketing products.

Standard 6: Technology Applications (0144.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0144.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in food science and processing.
- Locate, evaluate, and collect information from a variety of sources related to food science and processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0144.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0144.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to food science and processing.
0144.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of food science and processing.

Standard 7: Process/Workplace Skills (0144.S.7)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0144.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0144.7.2 Explore careers available in food science and processing.
0144.7.3 Use a variety of sources to investigate the educational requirements of various careers in food science.
0144.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0144.7.5 Demonstrate correct language usage in all oral and written work.
0144.7.6 Perform effectively in both leadership and non-leadership roles.
0144.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0144.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0144.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0144.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0144.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0144.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0144.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Hydroponics

This course emphasizes the scientific method in the production of hydroponic plants. The curriculum provides problem solving experiences and skills in plant propagation, plant growth and development in a soilless media.

Standard 1: Orientation to Hydroponics and Industry (0145.S.1)
Students will explore hydroponics technique and identify the progress in the industry.

Hydroponics and Industry Objectives
Students will:
0145.1.1 Describe the history and development of hydroponic growing techniques.
0145.1.2 Identify advantages and constraints of hydroponics.
0145.1.3 Compare and contrast traditional growing methods to soilless culture.

Standard 2: Classification of Hydroponic Plant Production System (0145.S.2)
Students will recognize the diversity of hydroponic systems and media.

Classification Objectives
Students will:
0145.2.1 Describe the difference between open and closed plant production system.
0145.2.2 Identify types and characteristics of soilless media.
0145.2.3 Describe solution, culture methods and nutrient film technique.

Standard 3: Plant Growth and Development (0145.S.3)
Students will describe plant structures and environmental requirements for plant growth.

Plant Growth and Development Objectives
Students will:
0145.3.1 Identify plant structures and functions.
0145.3.2 Describe environmental requirements for plant growth.

Standard 4: Leadership and Interpersonal Skill Development (0145.S.4)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0145.4.1 Serve as a small group team leader.
0145.4.2 Identify leadership and decision making skills.
0145.4.3 Participate in committee and leadership development activities.
0145.4.4 Conduct community and school improvement projects.

Standard 5: Developing Work-Based Experiential Programs (0145.S.5)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0145.5.1 Determine areas and careers of major interest in agriculture.
0145.5.2 Manage school-based hydroponics laboratory enterprises.
0145.5.3 Establish experience program record book procedures.

Standard 6: Laboratory Safety Skills (0145.S.6)
Students will practice and demonstrate safety in the laboratory.

Safety Skills Objectives
Students will:
0145.6.1 Establish a safe working environment.
0145.6.2 Identify safety polices and procedures.
0145.6.3 Demonstrate proper use of equipment.

Standard 7: Computer Applications in Hydroponics and Plant Science (0145.S.7)
Students will apply technology to investigate real-world problems.

Computer Applications Objectives
Students will:
0145.7.1 Use Internet for research applications in hydroponics.
0145.7.2 Identify how computer based systems may be used for hydroponics environmental control.
0145.7.3 Utilize keyboarding and word processing skills to prepare class reports.

Standard 8: Greenhouse Structures (0145.S.8)
Students will recognize environmental components for structure construction and operation.

Greenhouse Structures Objectives
Students will:
0145.8.1 Identify environmental controls (heating and cooling components) of a greenhouse.
0145.8.2 Explain the function of greenhouse structure components.
0145.8.3 Determine the appropriate site and location of a hydroponics greenhouse.

Standard 9: Producing Hydroponic Crops (0145.S.9)
Students will determine appropriate amendments and identify effective procedures for hydroponic crop management.

Hydroponic Crops Objectives
Students will:
0145.9.1 List requirements of hydroponic tomatoes and lettuce production systems.
0145.9.2 Identify other plants that may be produced hydroponically.
0145.9.3 Test, interpret and manage pH.
0145.9.4 Measure electrical conduction of nutrient solution.
0145.9.5 Mix and manage hydroponic solutions.
0145.9.6 Determine methods of biological insect control.
0145.9.7 Identify mineral deficiencies.

Leadership Development

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships.

Standard 1: Leadership Styles (0146.S.1)
Students will describe various leadership styles.

Leadership Styles Objectives
Students will:
0146.1.1 Define leadership.
0146.1.2 Explain traits and styles.
0146.1.3 Explore different personality traits.
0146.1.4 Recognize informal leader.

Standard 2: Developing Formal Leadership Methods (0146.S.2)
Students will explain leadership methods.

Formal Leadership Objectives
Students will:
0146.2.1 Describe duties of officers in an organization.
0146.2.2 Define all different forms of motions.
0146.2.3 Identify proper conduct for meetings.

Standard 3: Public Speaking (0146.S.3)
Students will acquire skills in public speaking.

Public Speaking Objectives
Students will:
0146.3.1 Present two required speeches.
0146.3.2 Prepare an introduction for invited guest speakers.
0146.3.3 Observe invited quest speakers for different speaking styles.
0146.3.4 Become involved in a controlled debate.
0146.3.5 Conduct small group discussions on current events.

Standard 4: Community Service (0146.S.4)
Students will develop skills to participate in community service.

Community Service Objectives
Students will:
0146.4.1 Conduct community projects. Depending on the community the class can do many different projects with the Chamber of Commerce, Rotary, United Way, etc.
0146.4.2 Conduct school improvement projects. Work with the student council in developing projects that will improve the school grounds, buildings, etc.
0146.4.3 Conduct projects that deal with drug awareness, drinking and driving, etc.

Standard 5: Goal Setting (0146.S.5)
Students will use goal setting, time management and stress management.

Goal Setting Objectives
Students will:
0146.5.1 Explore goal setting (long term and short term).

0146.5.2 Describe methods of time management.
0146.5.3 Identify stress reduction methods.

Standard 6: Job Seeking Skills (0146.S.6)
Students will develop job-seeking skills.

Job Seeking Skills Objectives
Students will:
0146.6.1 Explore areas of proper dress in the work place.
0146.6.2 Prepare a cover letter and resume.
0146.6.3 Describe proper interview techniques for an oral interview.

Standard 7: Interpersonal Relations (0146.S.7)
Students will demonstrate interpersonal relationships for job success.

Interpersonal Relations Objectives
Students will:
0146.7.1 Explain and discuss a paradigm shift.
0146.7.2 Write thank you letters to the teachers before graduation.
0146.7.3 Explore conflict resolution.
0146.7.4 Hold mock social gathering with adults.
0146.7.5 Explore proper ethics and values.

Standard 8: Technology Application (0146.S.8)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0146.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in leadership development.
- Locate, evaluate, and collect information from a variety of sources related to leadership development.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0146.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0146.8.3 Use TV/Satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to leadership development.
0146.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of leadership development.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Leadership Development (0147.S.1)
Students will participate in activities to promote leadership development.

Leadership Development Objectives
Students will:
0147.1.1 Identify the year FFA was formed.
0147.1.2 Name the author of the creed.
0147.1.3 Identify the location of the state and national convention.
0147.1.4 Name the state and national FFA advisors.
0147.1.5 Name the degree levels in FFA.
0147.1.6 Identify parts of the emblem.
0147.1.7 Present a speech on outdoor recreation.

Standard 2: Career Development (0147.S.2)
Students will research career development in outdoor recreation.

Career Development Objectives
Students will:
0147.2.1 Identify regional career opportunities in outdoor recreation including. Park Ranger, Recreation Manager, Instructor, Conservation Officer, First Aid/Safety Expert, Entertainment Manager, Business Manager, Outdoor Guide, Youth Camp Operator, Campground Owner, Riding Stable Owner and Lifeguard.
0147.2.2 Profile outdoor recreation specialists.
0147.2.3 Develop teamwork skills and activities.
0147.2.4 Develop public relation skills.

Standard 3: Outdoor Safety (0147.S.3)
Students will participate in activities to promote outdoor safety.

Outdoor Safety Objectives
Students will:
0147.3.1 Obtain Red Cross first aid certificate.
0147.3.2 Obtain Red Cross adult CPR certificate.
0147.3.3 Identify potential outdoor safety hazards.
0147.3.4 Identify poisonous plants.
0147.3.5 Identify poisonous insects.
0147.3.6 Identify poisonous animals.
0147.3.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 4: Natural Resource and Recreation (0147.S.4)
Students will identify natural resource and recreation areas.

Natural Resource and Recreation Objectives
Students will:
0147.4.1 Describe geological formations.
0147.4.2 Recognize services required for recreational areas.
0147.4.3 Recognize facilities required for recreational areas.

0147.4.4 Identify endangered species of plants and animals.
0147.4.5 Identify wetlands and riparian zones.
0147.4.6 Describe local, state and federal laws related to recreational enterprises.

Standard 5: Business Opportunities and Promotions (0147.S.5)
Students will recognize business opportunities and promotions.

Business Opportunities and Promotions Objectives
Students will:
0147.5.1 Recognize income potential from various types of recreational enterprises.
0147.5.2 Identify business procedures required of recreational enterprises.
0147.5.3 Design advertising media to promote a recreational area effectively.

Standard 6: Laboratory Investigation (0147.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0147.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0147.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0147.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0147.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Application (0147.S.7)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0147.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in outdoor recreation.
- Locate, evaluate, and collect information from a variety of sources related to outdoor recreation.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0147.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0147.7.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 8: Process/Work Place Skills (0147.S.8)
Students will demonstrate personal and group workplace skills.

Process/Work Place Skills Objectives
Students will:
0147.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0147.8.2 Explore careers available in outdoor recreation.
0147.8.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
0147.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0147.8.5 Demonstrate correct language usage in all oral and written work.
0147.8.6 Perform effectively in both leadership and non-leadership roles.
0147.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0147.8.8 Participate as a team member to complete a variety of assignments.

Poultry Science and Production

This agricultural science course is designed to give students a working knowledge of the poultry industry, which includes chickens, turkeys and other avian species. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection and economic and marketing principles related to employment. Students will develop a working knowledge of land use and poultry production to maintain an economical level of production. Upon completion course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Orientation to the Poultry Industry (0148.S.1)
Students will explore different facets of the poultry industry.

Poultry Industry Objectives
Students will:
0148.1.1 Describe the importance of the poultry industry to the state and national economy.
0148.1.2 Identify different types of poultry enterprises.
0148.1.3 Relate consumption trends in poultry products.
0148.1.4 Identify and analyze career opportunities in the poultry industry.

Standard 2: Selection for Production (0148.S.2)
Students will use industry standards for poultry selection.

Selection for Production Objectives
Students will:
0148.2.1 List the classes of poultry and identify common breeds.
0148.2.2 Describe characteristics of birds that relate to productivity.
0148.2.3 Explain criteria to consider in selecting a breed for various types of production.
0148.2.4 Describe factors that influence chick purchase decisions.
0148.2.5 Describe characteristics associated with high egg production and procedures used in culling.
0148.2.6 Describe selection characteristics of parent and grandparent seed stock lines.

Standard 3: Nutrition and Management (0148.S.3)
Students will study factors that affect profitability.

Nutrition and Management Objectives
Students will:
0148.3.1 Describe factors that affect cost of poultry and egg production.
0148.3.2 Determine facility and equipment requirements for various poultry enterprises.
0148.3.3 Formulate rations for laying flocks, turkeys and broilers.
0148.3.4 Describe methods of disease and parasite control.
0148.3.5 Explain environmentally friendly methods of litter and dead bird disposal.
0148.3.6 Use computer programs to maintain inventory, expenses, income and other pertinent records.

Standard 4: Poultry Health and Management (0148.S.4)
Students will recognize best management practices for flock health.

Poultry Health and Management Objectives
Students will:
0148.4.1 Determine the type of care and housing facilities needed for poultry.
0148.4.2 Identify mechanical injury and treatment requirements.
0148.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0148.4.4 Utilize techniques in administration of medicine and immunization.

0148.4.5 Design and utilize a flock health program in poultry production.

Standard 5: Anatomy and Physiology (0148.S.5)
Students will utilize the fundamentals of anatomy and physiology in the production of poultry.

Anatomy and Physiology Objectives
Students will:
0148.5.1 Identify the major parts and functions of the anatomy of various types of poultry.
0148.5.2 Identify the major parts and functions of the digestive system.
0148.5.3 Identify the major parts and functions of the reproductive system.
0148.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to poultry management.
0148.5.5 Identify and explain modern poultry breeding techniques.
0148.5.6 Analyze and explain data utilizing genotypic information to form a superior poultry program.

Standard 6: Solid Waste (0148.S.6)
Students will explore strategies for handling poultry waste.

Solid Waste Objectives
Students will:
0148.6.1 Describe sources of solid waste associated with poultry industries.
0148.6.2 Explain hazards in solid waste materials and disposal.
0148.6.3 Describe ways of disposing of solid waste.
0148.6.4 Identify NRCS and SCS programs available for assistance in litter disposal.
0148.6.5 Explain recycling.
0148.6.6 Describe composting.
0148.6.7 Identify methods and benefits of composting.

Standard 7: Marketing (0148.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:
0148.7.1 Research and study various livestock marketing techniques.
0148.7.2 Identify transportation and safety methods for livestock handling.
0148.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0148.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Leadership and Communication (0148.S.8)
Students will demonstrate leadership in the poultry industry.

Leadership and Communication Objectives
Students will:
0148.8.1 Present written and oral reasons in poultry judging events.
0148.8.2 Participate in FFA meetings and activities.
0148.8.3 Prepare and present speeches on issues involving the poultry industry using information available from magazines, trade journals, the Internet and other sources.

Standard 9: Technology Applications (0148.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0148.9.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in poultry production.
- Locate, evaluate, and collect information from a variety of sources related to poultry production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0148.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0148.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to poultry production.

0148.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of poultry production.

Standard 10: Process/Workplace Skills in Agribusiness (0148.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:

0148.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0148.10.2 Explore careers available in agribusiness.

0148.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.

0148.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0148.10.5 Demonstrate correct language usage in all oral and written work.

0148.10.6 Perform effectively in both leadership and non-leadership roles.

0148.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0148.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Lab Investigation (0148.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Lab Investigation Objectives
Students will:

0148.11.1 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0148.11.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0148.11.3 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

0148.11.4 Conduct a supervised agricultural experience program with appropriate records.

Small Animal Care and Management

This course is designed to give students a working knowledge of the small animal care industry, which includes dogs, cats, birds, reptiles and other pets. The course provides an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of small animals, their management and a keen business sense relating to small animals. Upon completion of this course, students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0149.S.1)
Students will demonstrate leadership skills for success in the small animal industry.

Leadership Objectives
Students will:
0149.1.1 Identify FFA and it's components.
0149.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0149.1.3 Identify appropriate career opportunities in the small animal care industry.
0149.1.4 Draft a resume, fill out a job application, and demonstrate job seek/keep skills.
0149.1.5 Develop personal relation and communication skills.
0149.1.6 Identify animal welfare ethics and other issues.
0149.1.7 Develop a working relationship with local veterinarians.

Standard 2: History and Selection of Animals (0149.S.2)
Students will provide background information and describe the desirable characteristics of domestic animals.

Animals Objectives
Students will:
0149.2.1 Relate the history of domestic animals to modern animal production.
0149.2.2 Describe and classify small animals according to purposes/uses.
0149.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0149.2.4 Relate the characteristics of breeds to methods of selection.
0149.2.5 Be able to differentiate between domestic and exotic animals.

Standard 3: Training, Handling and Restraint (0149.S.3)
Students will demonstrate safe handling and restraining techniques.

Training, Handling and Restraint Objectives
Students will:
0149.3.1 Identify and use tools related to training and handling/restraint of small animals.
0149.3.2 Identify methods and techniques used in restraint and training of small animals.
0149.3.3 Utilize basic commands and training methods.
0149.3.4 Identify AKC guidelines for instructing dogs.
0149.3.5 Utilize safety practices in training and handling.

Standard 4: Grooming and Clipping (0149.S.4)
Students will demonstrate skills in grooming and clipping.

Grooming and Clipping Objectives
Students will:
0149.4.1 Utilize safety practices in grooming and clipping small animals.
0149.4.2 Identify tools used in grooming.
0149.4.3 Describe grooming practices (bathing, clipping, nail trimming, combing/brushing).
0149.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0149.S.5)
Students will utilize the fundamentals of anatomy and physiology in caring for small animals.

Anatomy and Physiology Objectives
Students will:
0149.5.1 Identify the major parts and functions of the skeletal system.
0149.5.2 Identify the major parts and functions of the muscular system.
0149.5.3 Identify the major parts and functions of the nervous system.
0149.5.4 Identify the major parts and functions of the endocrine system.
0149.5.5 Identify the major parts and functions of the respiratory system.
0149.5.6 Identify the major parts and functions of the circulatory system.
0149.5.7 Identify the major parts and functions of the reproductive system.
0149.5.8 Identify the major parts and functions of the excretory system.
0149.5.9 Identify the major parts and functions of the digestive system.
0149.5.10 Explain the difference between ruminant and monogastric systems.
0149.5.11 Describe functions of other small animals systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0149.S.6)
Students will demonstrate competencies in animal health and management.

Animal Health and Management Objectives
Students will:
0149.6.1 Determine the type of care and housing facilities needed.
0149.6.2 Identify mechanical injury and basic first aid requirements.
0149.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0149.6.4 Utilize techniques in administering medicine and immunizing.

Standard 7: Nutrition (0149.S.7)
Students will describe the role of nutrition in small animal care.

Nutrition Objectives
Students will:
0149.7.1 Define terms associated with nutrition.
0149.7.2 List and describe the basic nutrients and their functions.
0149.7.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0149.7.4 Identify signs of nutritional deficiencies.
0149.7.5 Identify feeding and care requirements throughout life cycle and pregnancy.

Standard 8: Marketing (0149.S.8)
Students will demonstrate competencies in marketing small animals.

Marketing Objectives
Students will:
0149.8.1 Explore types of markets available.

0149.8.2 Identify transportation methods.
0149.8.3 Research types of laws, regulations and licenses needed in local area.
0149.8.4 Analyze costs of owning and operating a small animal care business.

Standard 9: Technology Applications (0149.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0149.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0149.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0149.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0149.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 10: Process/Workplace Skills in Agribusiness (0149.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:
0149.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0149.10.2 Explore careers available in agribusiness.
0149.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0149.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0149.10.5 Demonstrate correct language usage in all oral and written work.
0149.10.6 Perform effectively in both leadership and non-leadership roles.
0149.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0149.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Laboratory Investigation (0149.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0149.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0149.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0149.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0149.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Soil And Plant Science (Agronomy)

This area of study is designed to provide students with scientific knowledge and experiences essential to careers in soil and plant science. The course includes major units in soil formation, soil properties, land classification, fertility, plant growth and the impact of agriculture on the environment.

Standard 1: Orientation to Soil and Plant Science (0150.S.1)
Students will soil and plant science.

Soil and Plant Science Objectives
Students will:
0150.1.1 Research career opportunities in soil and plant science.
0150.1.2 Describe the impact of agriculture on the environment.
0150.1.3 List and describe the function of federal, state and local entities and interest groups concerned with soil and plant science.
0150.1.4 Examine the role of soil and plants in the ecosystem.

Standard 2: Leadership Development (0150.S.2)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0150.2.1 Participate in meetings using parliamentary law.
0150.2.2 Use interpersonal skills in team problem solving.
0150.2.3 Prepare and deliver a brief presentation on an agronomic topic.

Standard 3: Provide Work-Based Experiential Learning Opportunities (0150.S.3)
Students will participate in a work-base experience program.

Work-Based Objectives
Students will:
0150.3.1 Explore opportunities for work-based experience through supervised experience programs.
0150.3.2 Define record keeping terms for supervised experience programs.
0150.3.3 Develop budgets for potential supervised experience programs.

Standard 4: Soil Origin and Development (0150.S.4)
Students will identify how soil is formed and surveyed.

Soil Origin and Development Objectives
Students will:
0150.4.1 Determine how soil is formed.
0150.4.1 Interpret information from soil surveys.

Standard 5: Physical Properties of Soil (0150.S.5)
Students will identify the various physical properties of soil samples.

Soil Objectives
Students will:
0150.5.1 Define and determine soil depth.
0150.5.2 Define and determine soil texture.
0150.5.3 Define and determine soil structure.
0150.5.4 Define and determine soil permeability.

0150.5.5 Define and determine drainage.
0150.5.6 Define and determine slope.

Standard 6: Classification of Soils Into Soil Series and Land Capability Classes (0150.S.6)
Students will identify the various classification of soil.

Classification of Soils Objectives
Students will:
0150.6.1 Classify soils by common physical properties.
0150.6.2 Describe soil series of the region.
0150.6.3 Determine land capability classes and recommend appropriate land management practices.

Standard 7: Plant Nutrition and Soil Fertility (0150.S.7)
Students will identify the various functions of plant nutrition and soil fertility.

Plant Nutrition and Soil Fertility Objectives
Students will:
0150.7.1 List and describe the functions of macro and micronutrients.
0150.7.2 Describe and identify plant nutrient deficiencies.
0150.7.3 Explain the function and management of soil pH.
0150.7.4 Describe and engage in the process of soil testing.
0150.7.5 Interpret and apply data generated by soil testing.
0150.7.6 List and compare sources of plant nutrients.
0150.7.7 Identify nutrient deficiencies and plant diseases.
0150.7.8 Conduct plant growth experiments.
0150.7.9 Use soil-testing equipment.

Standard 8: Plant Structures and their Functions (0150.S.8)
Students will identify the various plant structures and their functions.

Plant Structures Objectives
Students will:
0150.8.1 Explain basic plant production requirements.
0150.8.2 Identify the major parts of a plant.
0150.8.3 Describe the function of the major parts of a plant.
0150.8.4 Demonstrate knowledge of plant growth processes photosynthesis, respiration and transpiration.

Standard 9: Row Crop Management (0150.S.9)
Students will identify the various methods to row crop management.

Row Crop Management Objectives
Students will:
0150.9.1 Identify row crops common to the area.
0150.9.2 Describe cultural requirements and production practices of row crops.
0150.9.3 List and describe harvesting methods.

Standard 10: Forage Management (0150.S.10)
Students will identify the various methods to row crop management.

Forest Management Objectives
Students will:
0150.10.1 Identify forage crops common to the area.
0150.10.2 Describe cultural requirements and production practices of forage crops.
0150.10.3 List and describe harvesting methods.

Standard 11: Soil and Water Conservation (0150.S.11)
Students will identify the various methods of soil and water conservation.

Soil and Water Conservation Objectives
Students will:
0150.11.1 Define and provide examples of erosion.
0150.11.2 Explain agricultural practices to conserve soil and reduce pollution (stewardship).
0150.11.3 Predict impacts of erosion.
0150.11.4 Identify and describe best management practices to prevent soil erosion.
0150.11.5 Utilize the World Wide Web to explore specialty areas in soil and plant science.

Standard 12: Laboratory Investigation (0150.S.12)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0150.12.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0150.12.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0150.12.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0150.12.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 13: Technology Applications (0150.S.13)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0150.13.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in soil and plant science.
- Locate, evaluate, and collect information from a variety of sources related to soil and plat science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0150.13.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0150.13.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to soil and plant science.
0150.13.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of soil and plant science.

Standard 14: Process/Workplace Skills (0150.S.14)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0150.14.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0150.14.2 Explore careers available in soil and plant science.
0150.14.3 Use a variety of sources to investigate the educational requirements of various careers in soil and plant science.
0150.14.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0150.14.5 Demonstrate correct language usage in all oral and written work.
0150.14.6 Perform effectively in both leadership and non-leadership roles.
0150.14.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0150.14.8 Participate as a team member to complete a variety of assignments.

Forestry 1

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Leadership Develop (0182.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Develop Objectives
Students will:
0182.1.1 Identify the year FFA was formed.
0182.1.2 Name the author of the creed.
0182.1.3 Identify the location of the state and national convention.
0182.1.4 Name the state and national FFA advisor.
0182.1.5 Name the degree levels in FFA.
0182.1.6 Identify parts of the emblem.

Standard 2: Safety Principles in Forestry (0182.S.2)
Students will identify and utilize appropriate safety equipment and regulations.

Safety Principles in Forestry Objectives
Students will:
0182.2.1 Wear appropriate safety gear.
0182.2.2 Maintain a safe working environment.
0182.2.3 Identify safety hazards of fire line construction and mop-up.

Standard 3: Identify Economic Trees in West Virginia (0182.S.3)
Students will demonstrate the skill of tree identification with various methods.

Economic Trees in West Virginia Objectives
Students will:
0182.2.1 Identify the following trees:
- Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine

0182.2.2 Identify by leaves.
0182.2.3 Identify by bark.
0182.2.4 Identify by taste and smell.
0182.2.5 Identify by twigs.
0182.2.6 Identify by fruit.
0182.2.7 Understand tree morphology.

Standard 4: Forest Fire Fighting Procedures (0182.S.4)
Students will demonstrate correct methods and use of proper equipment to control forest fires.

Forest Fire Objectives
Students will:
0182.4.1 Construct fire line using hand tools.
0182.4.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
0182.4.3 Extinguish remaining fire spots after main fire is contained (mop-up).
0182.4.4 Determine direction for fire line construction.
0182.4.5 Repair and service equipment after fire is extinguished.

0182.4.6 Use backpack pump to fight fire directly.

Standard 5: Forest Measurement Techniques (0182.S.5)
Students will identify and demonstrate forest measurement techniques.

Forest Measurement Techniques Objectives
Students will:
0182.5.1 Set up instrument for surveying.
0182.5.2 Use compass to maintain direction.
0182.5.3 Make linear measurements using surveyor's chain with compass.
0182.5.4 Make linear measurements by pacing with compass.
0182.5.5 Calculate the number of acres in a timber tract.
0182.5.6 Use hand/staff compass to determine bearing or Azimuth.
0182.5.7 Identify units of measurement (mile, rod, chain and acre).

Standard 6: Silviculture Treatment for Timber Stand Improvement (0182.S.6)
Students will identify silvicultural procedures.

Silviculture Treatment Objectives
Students will:
0182.6.1 Determine major forest type and primary uses.
0182.6.2 Determine proper spacing using D+6 rule.
0182.6.3 Use increment borer to determine age and growth rate.
0182.6.4 Select and utilize pruning and thinning methods for a timber stand.
0182.6.5 Fell and limb trees.

Standard 7: Laboratory Investigations/Hands-On Learning (0182.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0182.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0182.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0182.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0182.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Chainsaw Safety (0183.S.1)
Students will demonstrate proper safety techniques for chainsaw usage.

Chainsaw Safety Objectives
Students will:
0183.1.1 Identify and use safety clothing and equipment.
0183.1.2 Use proper starting techniques.
0183.1.3 Identify proper safety rules with 100% accuracy.
0183.1.4 Identify and correct hazardous operational conditions.

Standard 2: Chainsaw Maintenance (0183.S.2)
Students will demonstrate proper chainsaw maintenance.

Chainsaw Maintenance Objectives
Students will:
0183.2.1 Properly sharpen chain.
0183.2.2 Determine and adjust chain for proper tension.
0183.2.3 Demonstrate proper cleaning and storage of chainsaw.
0183.2.4 Replace sprocket on chainsaw.
0183.2.5 Replace bar on chainsaw.
0183.2.6 Replace broken chain link.
0183.2.7 Clean and service carburetor and air cleaner.
0183.2.8 Replace chain clutch as needed.
0183.2.9 Adjust carburetor for maximum efficiency.
0183.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber (0183.S.3)
Students will correctly calculate the volume of standing timber using various tools and scales.

Volume of Standing Timber Objectives
Students will:
0183.3.1 Define and calculate board foot and cord wood volumes.
0183.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
0183.3.3 Determine number of logs per tree using tree stick or clinometers.
0183.3.4 Record volume number of individual trees using tally sheet method.
0183.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0183.3.6 Calculate volume of pulpwood by cords.

Standard 4: Wildlife Habitat Management (0183.S.4)
Students will demonstrate proper techniques to develop wild life habitat through forestry practices.

Wildlife Habitat Management Objectives
Students will:
0183.4.1 Monitor and improve water quality.
0183.4.2 Improve habitat for bird, fish and game.
0183.4.3 Understand the importance of the forest, field and edge.
0183.4.4 Identify potential den and mast trees.

Standard 5: Laboratory Investigations – Hands-On Learning (0183.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:

0183.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0183.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0183.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0183.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Technology Applications in Forestry (0183.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0183.6.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0183.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0183.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

0183.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Personal Leadership Skills Development (0184.S.1)
Students will conduct research in the forest industry and make presentations.

Personal Leadership Skills Development Objectives
Student will:
0184.1.1 Describe the parts of a good speech.
0184.1.2 Explain how to present a desirable speech.
0184.1.3 Correctly conduct research in topics concerning forestry.
0184.1.4 Deliver a speech on a forestry topic.

Standard 2: Advanced Dendrology Skills (0184.S.2)
Students will demonstrate advanced skills in tree identification.

Advanced Dendrology Skills Objectives
Students will:
0184.2.1 Identify by flowers.
0184.2.2 Identify by growth characteristics.
0184.2.3 Identify by site conditions.
0184.2.4 Identify by distribution.

Standard 3: Safety Training in Forestry (0184.S.3)
Students will demonstrate safety practices with equipment used in forestry.

Safety Training Objectives
Students will:
0184.3.1 Demonstrate safety with hand tools.
0184.3.2 Demonstrate safety with chainsaws.
0184.3.3 Demonstrate safety with tractors.
0184.3.4 Demonstrate safety on the fire line.

Standard 4: Operation and Maintenance of Forestry Equipment (0184.S.4)
Students will demonstrate operation and maintenance of equipment used in forestry.

Forestry Equipment Objectives
Students will:
0184.4.1 Demonstrate the proper use and maintenance of hand tools.
0184.4.2 Demonstrate the proper use and maintenance of chainsaws.
0184.4.3 Demonstrate the proper use and maintenance of tractors.
0184.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Silvicultural Applications for Timber Stands (0184.S.5)
Students will apply silviculture practices in timber stands.

Timber Stands Objectives
Students will:
0184.5.1 Demonstrate forest reproduction techniques.

0184.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
0184.5.3 Define clear-cut.

Standard 6: Laboratory Investigations/Hands-on Learning (0184.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0184.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0184.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0184.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0184.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0184.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0184.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0184.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0184.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0184.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Parliamentary Procedure (0185.S.1)
Students will demonstrate parliamentary procedure.

Parliamentary Procedure Objectives
Students will:
0185.1.1 Identify proper procedures for conducting a meeting.
0185.1.2 Write and present a committee report.
0185.1.3 Identify components of a program of activities.

Standard 2: Safety Procedures in Fire Line Construction (0185.S.2)
Students will demonstrate procedures to safely construct a fire line.

Fire Line Construction Objectives
Students will:
0185.2.1 Explain fire line safety.
0185.2.2 Explain fire line construction.
0185.2.3 Explain forest fire mop-up.
0185.2.4 Explain the use of topographic maps in locating access roads and trails.
0185.2.5 Explain the use of topographic maps in fire location.
0185.2.6 Repair, service and store equipment.

Standard 3: Use of Forest Surveying Equipment (0185.S.3)
Students will utilize equipment necessary to survey a forest.

Forest Surveying Equipment Objectives
Students will:
0185.3.1 Interpret surface features using aerial photography and topographic maps.
0185.3.2 Conduct a boundary survey using a hand compass and pacing.
0185.3.3 Visit a courthouse and conduct a title search.
0185.3.4 Plot bearings from deeds.
0185.3.5 Calculate percent slope using a clinometer.
0185.3.6 Orientate topographic map using hand compass.
0185.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Utilization of Best Management Practices (0185.S.4)
Students will describe the best management practices in forest road construction.

Best Management Practices Objectives
Students will:
0185.4.1 Lay out roads in compliance with West Virginia forest standards.
0185.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0185.4.3 Describe the process of installing culverts, water breaks and "woods" bridges.
0185.4.4 Design skid roads.
0185.4.5 Monitor water quality.
0185.4.6 Reseed skid trails and log landings.

Standard 5: Wood Products Utilization (0185.S.5)
Students will process, measure and market forest products.

Wood Products Utilization Objectives
Students will:
0185.5.1 Demonstrate competency in felling, bucking and skidding selected trees.
0185.5.2 Scale logs and lumber.
0185.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Laboratory Investigations – Hands-On Learning (0185.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0185.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0185.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0185.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0185.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0185.S.7)
Students will apply technology to investigate real-world problems.

Forestry Objectives
Students will:
0185.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0185.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0185.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0185.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Forestry Equipment: Identification and Use (0186.S.1)
Students will demonstrate safe use of forestry equipment.

Forestry Equipment Objectives
Students will:
0186.1.1 Identify and use the following:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

Standard 2: Conduct a Timber Cruise (0186.S.2)
Students will demonstrate skills needed to conduct a timber cruise using various equipment.

Timber Cruise Objectives
Students will:
0186.2.1 Mark boundaries and corners of tract.
0186.2.2 Use compass to direct cruising operation.
0186.2.3 Measure distance between plot center (by pacing).
0186.2.4 Record trees using tally sheet method.
0186.2.5 Use wedge prism (BAF 10 or BAF 20).
0186.2.6 Calculate board foot volumes using double log scale.

Standard 3: Application of Best Management Practices (0186.S.3)
Students will apply best management practices in a forestry setting.

Application of Best Management Practices Objectives
Students will:
0186.3.1 Lay out roads in compliance with West Virginia forest standards.
0186.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0186.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
0186.3.4 Design skid roads.
0186.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
0186.3.6 Scale logs and lumber.
0186.3.7 Monitor water quality.
0186.3.8 Reseed skid trails and log landings.

Standard 4: Laboratory Investigations – Hands-On Learning (0186.S.4)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0186.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0186.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0186.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0186.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Technology Applications in Forestry (0186.S.5)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0186.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0186.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0186.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom a assignments related to forestry.

0186.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Process/Workplace Skills in Forestry (0186.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0186.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0186.6.2 Explore careers available in forestry.

0186.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

0186.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0186.6.5 Demonstrate correct language usage in all oral and written work.

0186.6.6 Perform effectively in both leadership and non-leadership roles.

0186.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0186.6.8 Participate as a team member to complete a variety of assignments.

Forestry Science And Ecology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the forestry industry. Major instructional concepts include the scientific aspects of dendrology, silviculture, integrated wildlife management and ecology. Additionally, the student will study safety, surveying and measuring timber.

Standard 1: Leadership Development (0187.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Development Objectives
Students will:
0187.1.1 Identify the year FFA was formed.
0187.1.2 Name the author of the creed.
0187.1.3 Identify the location of the state and national convention.
0187.1.4 Name the state and national FFA advisor.
0187.1.5 Name the degree levels in FFA.
0187.1.6 Identify parts of the emblem.

Standard 2: Safety (0187.S.2)
Students will identify and utilize appropriate safety procedures associated with forestry.

Safety Objectives
Students will:
0187.2.1 Wear appropriate safety gear.
0187.2.2 Maintain a safe working environment.
0187.2.3 Identify and use safety clothing and equipment.
0187.2.4 Identify proper safety rules with 100% accuracy.
0187.2.5 Identify and correct hazardous operational conditions.

Standard 3: Fire Line Safety (0187.S.3)
Students will demonstrate appropriate safety practices involved in creating a fire line.

Fire Line Safety Objectives
Student will:
0187.3.1 Identify fire fighting tools.
0187.3.2 Explain fire line safety.
0187.3.3 Explain fire line construction.
0187.3.4 Explain forest fire mop-up.
0187.3.5 Explain the use of topographic maps in location access roads and trails.
0187.3.6 Explain the use of topographic maps in fire location.

Standard 4: Forestry Equipment (0187.S.4)
Students will identify equipment associated with forestry and explain their use.

Forestry Equipment Objectives
Students will:
0187.4.1 Identify by sight:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

0187.4.2 Explain the use of each tool.

Standard 5: Dendrology (0187.S.5)
Students will demonstrate appropriate tree identification techniques.

Dendrology Objectives
Students will:
0187.5.1 Identify by leaves.
0187.5.2 Identify by bark.
0187.5.3 Identify by twigs.
0187.5.4 Identify by fruit.

Standard 6: Measurements (0187.S.6)
Students will demonstrate various methods of measurements involving forestland and product measurements.

Measurements Objectives
Students will:
0187.6.1 Organize and set up instruments for surveying.
0187.6.2 Use compass to maintain direction.
0187.6.3 Make linear measurements using surveyor's chain with compass.
0187.6.4 Make linear measurements by pacing with compass.
0187.6.5 Calculate the number of acres in a timber tract.
0187.6.6 Use hand/staff compass to determine bearing or Azimuth.
0187.6.7 Identify units of measurement (mile, rod, chain and acre.)
0187.6.8 Define and calculate board foot and cord wood volumes.
0187.6.9 Measure standing trees at diameter breast height using tree stick and diameter tape.
0187.6.10 Determine number of logs per tree using tree stick or clinometer.
0187.6.11 Record volume number of individual trees using tally sheet method.
0187.6.12 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0187.6.13 Calculate volume of pulpwood by cords.
0187.6.14 Interpret surface features using aerial photography and topographic maps.
0187.6.15 Conduct a boundary survey using hand compass and pacing.
0187.6.16 Calculate percent slope using a clinometer.
0187.6.17 Orientate topographic map using hand compass.
0187.6.18 Mark boundaries and corners of tract.
0187.6.19 Use compass to direct cruising operation.
0187.6.20 Measure distance between plot center (by pacing).
0187.6.21 Record trees using tally sheet method.
0187.6.22 Use wedge prism (BAF 10 or BAF 20).
0187.6.23 Calculate board foot volumes using double log scale.

Standard 7: Silviculture (0187.S.7)
Students will utilize various silviculture practices.

Silviculture Objectives
Students will:
0187.7.1 Determine major forest type and primary uses.
0187.7.2 Determine proper spacing using D+6 rule.
0187.7.3 Use increment borer to determine age and growth rate.
0187.7.4 Recognize insect and disease damage and mark damaged area for salvage.
0187.7.5 Identify forest reproduction techniques.
0187.7.6 Demonstrate the technique of girdling in the process of removing undesirable trees.
0187.7.7 Define clear-cutting.

Standard 8: Wildlife (0187.S.8)
Students will demonstrate correct wildlife management skills.

Wildlife Objectives
Students will:
0187.8.1 Monitor and improve water quality.
0187.8.2 Improve habitat for bird, fish and game.
0187.8.3 Understand the importance of the forest, field and edge.
0187.8.4 Identify potential den and mast trees.

Standard 9: Best Management Practices (0187.S.9)
Students will demonstrate an awareness of best management practices used in forestry.

Best Management Practices Objectives
Students will:
0187.9.1 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0187.9.2 Understand the importance of installing culverts, water breaks and "woods" bridges.
0187.9.3 Design skid roads.
0187.9.4 Monitor water quality.

Natural Resource Management 1

This agricultural science course is designed to provide students with science concepts and skills in natural resource management that will be useful in various occupations in the field. Major emphasis will be on the scientific concepts involving air, water, aquatic life, wildlife management and recreation. Interaction of ecosystems and their relationship to human populations will be studied. This field of study will prepare students for entry-level occupations in the natural resources area.

Standard 1: Natural Resource and the Environment (0188.S.1)
Students will describe the relationship between natural resources and the environment.

Natural Resource and the Environment Objectives
Students will:
0188.1.1 Identify exhaustible and inexhaustible resources.
0188.1.2 Explain the importance of natural resources.
0188.1.3 Describe the interaction of people with the environment.

Standard 2: Air and Quality (0188.S.2)
Students will explain the importance of air and maintaining its quality.

Air and Quality Objectives
Students will:
0188.2.1 Identify air pollutants and their sources.
0188.2.2 Describe the effect of air pollution on humans, other living things and materials.
0188.2.3 Sample, monitor and analyze air quality for physical and chemical properties.
0188.2.4 Examine wind (air) as an alternative energy source.

Standard 3: Water Quality (0188.S.3)
Students will explain the importance of water and maintaining its quality.

Water Quality Objectives
Students will:
0188.3.1 Identify sources of water and water pollutants.
0188.3.2 Explain the effect of water pollution on the ecosystem.
0188.3.3 Describe the hydroponical cycle.
0188.3.4 Identify point and non-point source pollution.
0188.3.5 Describe wetlands, their use, importance and preservation.
0188.3.6 Identify uses of water in agriculture.
0188.3.7 Explain methods of managing wastewater.
0188.3.8 Determine composition of wastewater using water-testing equipment.
0188.3.9 Explain methods of protecting water sources.

Standard 4: Aquatic Life (0188.S.4)
Students will demonstrate aquatic life and natural resource management skills.

Aquatic Life Objectives
Students will:
0188.4.1 Identify game fish species and other aquatic wildlife.
0188.4.2 Explain water quality requirements for aquatic wildlife.
0188.4.3 Explain fishing laws and regulations.
0188.4.4 Describe fish hatchery techniques.
0188.4.5 Check for pond oxygen deficiency and prescribe remedial programs.
0188.4.6 Explain stratification and fish adaptability.

0188.4.7 Identify a management plan for a designated stream, lake or pond.

Standard 5: Wildlife (0188.S.5)
Students will demonstrate of wildlife management skills.

Wildlife Objectives
Students will:
0188.5.1 Identify and classify species of birds and wildlife animals.
0188.5.2 List governmental agencies concerned with wildlife conservation.
0188.5.3 Outline a plan for stimulating native and introduced game populations.
0188.5.4 Outline a plan for hatching game bird eggs.
0188.5.5 Identify common diseases of game birds and animals.
0188.5.6 Identify practices that can be used to protect wildlife.
0188.5.7 Evaluate wildlife food and cover crops.
0188.5.8 Estimate animal populations on given areas of land.

Standard 6: Outdoor Recreation (0188.S.6)
Students will demonstrate competencies in outdoor recreation management.

Outdoor Recreation Objectives
Students will:
0188.6.1 List demands by the public for different types of outdoor recreation experiences.
0188.6.2 Recognize types of natural resources recreational areas and the service and facilities required.
0188.6.3 Recognize the income potential from various types of recreational enterprises.
0188.6.4 Identify business procedures required of a recreational enterprise.
0188.6.5 Describe local, state and federal laws pertaining to given enterprises.
0188.6.6 Design advertising media to promote a recreation area effectively.

Standard 7: Leadership (0188.S.7)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0188.7.1 Participate in FFA meetings and activities.
0188.7.2 Utilize record keeping skills in work-based experience programs (SAE).

Standard 8: Laboratory Investigations (0188.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0188.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0188.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0188.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0188.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 9: Technology Applications (0188.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0188.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0188.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0188.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.

0188.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 10: Process/Workplace Skills (0188.S.10)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0188.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0188.10.2 Explore careers available in natural resource management.

0188.10.3 Use a variety of sources to investigate the educational requirements of various careers in natural resource management.

0188.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0188.10.5 Demonstrate correct language usage in all oral and written work.

0188.10.6 Perform effectively in both leadership and non-leadership roles.

0188.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0188.10.8 Participate as a team member to complete a variety of assignments.

Natural Resource Management II

This agricultural science course is designed to provide students with advanced science concepts and skills in natural resource management. Major emphasis will be on soil, forestry, and land use planning including solid waste and hazardous waste disposal and soil fertility. This field of study prepares students for entry-level occupations in the area of natural resources management.

Standard 1: Occupations in Natural Resources (0189.S.1)
Students will describe the occupations related to natural resources.

Occupations in Natural Resources Objectives
Students will:
0189.1.1 Identify occupations in natural resource management.
0189.1.2 Determine requirements for occupational entry in natural resource management fields.
0189.1.3 Identify typical activities performed by natural resource workers.

Standard 2: Soils (0189.S.2)
Students will explain soils and their role in natural resource management.

Soils Objectives
Students will:
0189.2.1 Identify factors that affect soil formation and describe the significance of each.
0189.2.2 Make "feel" tests of wet and dry soil samples and classify each as sandy, loamy or clayey.
0189.2.3 Determine percentage of sand, loam and clay in soil samples and classify according to texture.
0189.2.4 Classify samples of topsoil in one of the three color groups.
0189.2.5 Determine pH values of soil.
0189.2.6 Classify soils with respect to permeability.
0189.2.7 Determine moisture content of soil.
0189.2.8 Recognize causes of soil erosion.
0189.2.9 Categorize soils into their land use capability classes.
0189.2.10 Identify appropriate erosion control measures for soils.
0189.2.11 Read soil maps and interpret terms and symbols.
0189.2.12 Develop a conservation land use plan for a farm.

Standard 3: Soil Fertility (0189.S.3)
Students will perform competencies related to maintaining soil fertility.

Soil Fertility Objectives
Students will:
0189.3.1 Collect soil samples, complete data forms and submit to a laboratory for analysis.
0189.3.2 Test soil for acidity or alkalinity and prescribe remedial measures.
0189.3.3 Make plant tissue analyses.
0189.3.4 Explain analysis data on a fertilizer tag.
0189. 3.5 Identify macronutrients and their deficiency symptoms.

Standard 4: Forestry (0189.S.4)
Students will explain the role of forestry principles in natural resource management.

Forestry Objectives
Students will:
0189.4.1 Relate benefits of forest resources to land, human and economic requirements.
0189.4.2 Recognize and name forest products.
0189.4.3 Identify tree parts and their functions.

0189.4.4 Identify common tree species.
0189.4.5 Plant tree seedlings using approved practices.
0189.4.6 Identify common tree pests and diseases.
0189.4.7 Prescribe control measures for pests and diseases.
0189.4.8 Describe the effect of forest fires on the forest floor.
0189.4.9 Identify fire suppression tools and equipment and state their functions.

Standard 5: Land Use Planning (0189.S.5)
Students will describe the principles of land use planning.

Land Use Planning Objectives
Students will:
0189.5.1 Outline steps in the land use planning process.
0189.5.2 Assemble information pertinent to developing a comprehensive plan.
0189.5.3 Describe functions of comprehensive plans and zoning ordinances.
0189.5.4 Obtain distances by pacing and using steel tapes.
0189.5.5 Use appropriate equipment to conduct a basic survey.
0189.5.6 Give legal descriptions of selected plots of land.
0189.5.7 Run a traverse with the surveyor's staff compass.

Standard 6: Minerals (0189.S.6)
Students will explain the role of minerals in natural resource management.

Minerals Objectives
Students will:
0189.6.1 Identify and classify samples of rocks and minerals common to the state.
0189.6.2 Describe formation of coal in the earth's crust.
0189.6.3 List functions of common minerals.
0189.6.4 Describe procedures in locating, extracting and processing minerals.
0189.6.5 Describe the impact of mining on the environment.
0189.6.6 Identify methods of mineral conservation.
0189.6.7 Identify a plan for restoration of an area that has been disturbed by mineral extraction.

Standard 7: Solid Waste (0189.S.7)
Students will describe the concepts of solid waste management.

Solid Waste Objectives
Students will:
0189.7.1 Describe kinds and sources of solid waste.
0189.7.2 Explain hazards in solid waste materials and disposal.
0189.7.3 Describe methods of solid waste disposal.
0189.7.4 Explain recycling.
0189.7.5 Describe composting.
0189.7.6 Explore methods and benefits of composting.

Standard 8: Hazardous Waste (0189.S.8)
Students will describe the concepts of hazardous waste management.

Hazardous Waste Objectives
Students will:
0189.8.1 Explain hazardous waste.
0189.8.2 Describe ecotoxicology.
0189.8.3 Explain disposing of hazardous waste.
0189.8.4 Explain safety procedures and clean-up of spills.

Standard 9: Leadership (0189.S.9)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0189.9.1 Participate in FFA meetings and activities.

Standard 10: Supervised Agricultural Experience Program (SAE) (0189.S.10)
Students will conduct a supervised agricultural experience program.

SAE Objectives
Students will:
0189.10.1 Conduct an experience program in the natural resource management area.
0189.10.2 Maintain appropriate records on the experience program.

Standard 11: Laboratory Investigations (0189.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0189.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0189.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0189.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0189.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 12: Technology Applications (0189.S.12)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0189.12.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0189.12.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0189.12.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.
0189.12.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 13: Process/Workplace Skills (0189.S.13)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0189.13.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize,

analyze, and report data.

0189.13.2 Explore careers available in natural resource management.

0189.13.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.

0189.13.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0189.13.5 Demonstrate correct language usage in all oral and written work.

0189.13.6 Perform effectively in both leadership and non-leadership roles.

0189.13.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0189.13.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Leadership and Communication Development (0190.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0190.1.1 Identify FFA history.
0190.1.2 Demonstrate proper use of parliamentary procedure.
0190.1.3 Participate in FFA activities.
0190.1.4 Prepare and deliver a brief presentation on a wildlife or natural resource topic.

Standard 2: History of Wildlife Management (0190.S.2)
Students will describe the importance of wildlife management and its impact on conservation.

History of Wildlife Management Objectives
Students will:
0190.2.1 Define and describe wildlife trends and their impact on management.
0190.2.2 Identify wildlife legalities and ethics.
0190.2.3 Define natural resources conservation.

Standard 3: Concepts of Wildlife Management (0190.S.3)
Students will describe the relationships between wildlife, humans and the ecosystem.

Concepts of Wildlife Management Objectives
0190.3.1 Define succession stages related to wildlife management.
0190.3.2 Describe carrying capacity as related to wildlife.
0190.3.3 Define horizontal and vertical structuring.
0190.3.4 Explain ecological principles and their application to wildlife management.

Standard 4: Habitat Management Practices (0190.S.4)
Students will determine the relationship between wildlife and the environment with approved practices in managing wildlife habitat.

Habitat Management Practices Objectives
Students will:
0190.4.1 Explain ecological principles applied to fish and wildlife.
0190.4.2 Design a wildlife management plan.
0190.4.3 Identify forest management practices for improving habitat.
0190.4.4 Identify agricultural management practices for improvement of habitat.
0190.4.5 Define and describe wetlands and their use.
0190.4.6 Identify government assistance available for habitat improvement.
0190.4.7 Construct and erect wildlife feeders/nest boxes.

Standard 5: Animal Life Histories (0190.S.5)
Students will use technology to identify the characteristics of wildlife and the relationship between species.

Animal Life Histories Objectives
Students will:

0190.5.1 Identify life cycles of wildlife species.
0190.5.2 Describe interrelationship of wildlife species.
0190.5.3 Identify common relationships between humans and wildlife.
0190.5.4 Search the Internet to secure wildlife information.

Standard 6: Water and Water Quality (0190.S.6)
Students will determine the relationships between water and the environment and the recommended practices for conserving these resources.

Water Objectives
Students will:
0190.6.1 Identify sources of water and water pollutants.
0190.6.2 Explain the effects to water pollution on the ecosystem.
0190.6.3 Identify point and non-point source pollution and describe possible controls.
0190.6.4 Describe wetlands, their use, importance and preservation.
0190.6.5 Explain methods of protecting water sources.

Standard 7: Wildlife Values as a Resource (0190.S.7)
Students will describe the benefit of wildlife as a resource to society.

Wildlife Values Objectives
Students will:
0190.7.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
0190.7.2 Define recreational values of fish and wildlife.
0190.7.3 Describe social values of fish and wildlife.
0190.7.4 Identify esthetic values of fish and wildlife resources.
0190.7.5 Describe scientific and educational values of fish and wildlife.
0190.7.6 Evaluate negative impact of wild animals on humans.

Standard 8: Develop a Work-Based Experiential Program (SAE) in Wildlife Management (0190.S.8)
Students will explore careers and learn the rational for and plan a SAE.

SAE Objectives
Students will:
0190.8.1 Define and explain supervised experience programs in agricultural and natural resources.
0190.8.2 Explore opportunities for work-based learning in natural resources.
0190.8.3 Define record keeping terms for supervised experience programs.
0190.8.4 Establish a supervised experience program in agriculture or natural resources.

Grounds Maintenance

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation.

Standard 1: Leadership and Communication Development (0201.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0201.1.1 Participate in FFA activities and programs.
0201.1.2 Prepare and deliver short speeches.
0201.1.3 Identify interview and employment readiness skills.
0201.1.4 Prepare a resume.

Standard 2: Grounds Maintenance Tools and Equipment (0201.S.2)
Students will practice and demonstrate safety with ground maintenance tools, equipment and activities.

Grounds Maintenance Tools and Equipment Objectives
Students will:
0201.2.1 Identify tools and equipment used in grounds maintenance.
0201.2.2 Perform maintenance and service operations on tools and equipment.
0201.2.3 Use tools and equipment safely under job site conditions.
0201.2.4 Identify and safely use potentially hazardous fuels.

Standard 3: Control Pests in Lawns, Flowers and Shrubs (0201.S.3)
Students will explain the practices of safe pesticide use and the concept of integrated pest management.

Control Pests in Lawns, Flowers and Shrubs Objectives
Students will:
0201.3.1 Identify, calibrate and safely use equipment.
0201.3.2 Identify and use personal safety clothing and equipment.
0201.3.3 Identify common pests, diseases and appropriate control techniques including integrated pest management (IPM).
0201.3.4 Read and demonstrate understanding of pesticide labels.

Standard 4: Plant and Maintain Lawns, Flower Beds, and Shrubs (0201.S.4)
Students will demonstrate practices pertaining to the establishment and maintenance of lawns, flower beds and shrubs.

Plant and Maintain Lawns, Flower Beds, and Shrubs Objectives
Students will:
0201.4.1 Identify safe and appropriate mowing techniques.
0201.4.2 Use an edger following safety procedures.
0201.4.3 Aerate and dethatch turf.
0201.4.4 Irrigate lawn, flowers and shrubs.
0201.4.5 Take soil samples using correct procedures.
0201.4.6 Analyze soil test results and determine fertilizer needs.
0201.4.7 Apply fertilizer and lime to various areas.
0201.4.8 Prune shrubs according to recommended practices.
0201.4.9 Mulch landscape plants.
0201.4.10 Provide appropriate winter protection for plants.

Standard 5: Construct and Maintain Grounds Structures (0201.S.5)
Students will build and maintain permanent structures within a landscaped design.

Grounds Structures Objectives
Students will:
0201.5.1 Mix and pour concrete.
0201.5.2 Build and maintain wood structures.
0201.5.3 Seal asphalt walks and driveways.

Standard 6: Developing Work-Based Experiential Program (SAE) (0201.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0201.6.1 Explore opportunities for supervised agricultural experience programs.
0201.6.2 Establish a supervised agricultural experience program in grounds maintenance.
0201.6.3 Maintain records of experience program activities, expenses and earnings.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Leadership Development (0212.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0212.1.1 Demonstrate an awareness of FFA and its components.
0212.1.2 Utilize record-keeping skills in work-based experience programs.
0212.1.3 Develop and exhibit communication skills.
0212.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0212.1.5 Demonstrate personal and social skills.
0212.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Plant Classification and Identification (0212.S.2)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0212.2.1 Develop an understanding of the natural classification system for the plant kingdom.
0212.2.2 Identify plant species and explore their benefit to people.
0212.2.3 Identify and research plants that are important to the greenhouse industry.
0212.2.4 Describe the plant processes involved with plant growth and development.
0212.2.5 List plant growth regulators and document their effects on plants.
0212.2.6 Explain how essential elements become available for plant use.
0212.2.7 Identify and document the effects of environmental factors on plant growth.
0212.2.8 Compare and contrast types of plant-growing media.
0212.2.9 Determine appropriate amendments for optimum plant growth.
0212.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Plant Processes and Propagation (0212.S.3)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0212.3.1 Perform methods of propagating plants.
0212.3.2 Manipulate total environment from juvenile to mature plant.
0212.3.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Pest Management (0212.S.4)
Students will identify proper pesticide use and pest management.

Pest Management Objectives
Students will:
0212.4.1 Explain and apply the concepts of integrated pest management.
0212.4.2 Identify safety guidelines for tools, equipment and pesticide use.

0212.4.3 Identify pests and evaluate control methods according to label interpretation.
0212.4.4 Recognize, calibrate and operate pesticide application equipment.
0212.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
0212.4.6 Demonstrate knowledge of and interpret federal and state pesticide laws.

Standard 5: Selected Specialty Areas in Horticulture (0212.S.5)
Students will identify the various specialty areas in horticulture.

Specialty Areas in Horticulture Objectives
Students will:
0212.5.1 Explore professions in floriculture and understand the scope of job opportunities.
0212.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.
0212.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.
0212.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.
0212.5.5 Explore professions in nursery production and understand job requirements.
0212.5.6 Demonstrate techniques and procedures used in the nursery production industry.
0212.5.7 Research careers in the landscape and turf industry.
0212.5.8 Perform basic landscape design, plantings and maintenance techniques.
0212.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Laboratory Investigation (0212.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0212.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0212.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0212.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0212.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications (0212.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0212.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in horticulture.
- Locate, evaluate, and collect information from a variety of sources related to horticulture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0212.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0212.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.
0212.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Process/Workplace Skills (0212.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0212.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0212.8.2 Explore careers available in horticulture.
0212.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.
0212.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0212.8.5 Demonstrate correct language usage in all oral and written work.
0212.8.6 Perform effectively in both leadership and non-leadership roles.
0212.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0212.8.8 Participate as a team member to complete a variety of assignments.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Leadership and Communication Development (0213.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0213.1.1 Describe FFA and its components.
0213.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0213.1.3 Identify appropriate career opportunities in the floriculture industry.
0213.1.4 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
0213.1.5 Develop personal relation and communication skills.
0213.1.6 Demonstrate an awareness of employment and floriculture industry ethics.

Standard 2: Principles of Design (0213.S.2)
Students will utilize principles of design to critique floral designs.

Principles of Design Objectives
Students will:
0213.2.1 Utilize floriculture principles, elements and theory of design.
0213.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
0213.2.3 Understand the concepts and use of color.

Standard 3: Cut Flowers and Greens (0213.S.3)
Students will identify and maintain commonly used cut flowers and foliage.

Cut Flowers and Greens Objectives
Students will:
0213.3.1 Identify and classify flowers and foliage.
0213.3.2 Understand the techniques to maintain optimum flower and foliage quality.

Standard 4: Floral Materials and Supplies (0213.S.4)
Students will identify and manipulate materials and supplies used in floral design.

Floral Materials and Supplies Objectives
Students will:
0213.4.1 Identify the basic mechanics and supplies used in floral design.
0213.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
0213.4.3 Demonstrate construction of bows.

Standard 5: Selected Specialty Areas (0213.S.5)
Students will design the appropriate product according to the occasion.

Selected Specialty Areas Objectives
Students will:
0213.5.1 Design boutonnieres and corsages.
0213.5.2 Understand concepts in floral design of holiday arrangements.
0213.5.3 Identify designs for weddings and receptions.
0213.5.4 Recognize practice in sympathy floral designs.
0213.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.

0213.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Floral Operations and Management (0213.S.6)
Students will develop strategies and understand the components used in floral operations and management.

Floral Operations and Management Objectives
Students will:
0213.6.1 Develop skills in retail sales using various selling techniques.
0213.6.2 Develop a visual merchandising plan to project the right image.
0213.6.3 Identify the components and the importance of a floral delivery system.
0213.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts provide students with individual goals and objectives including: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Leadership Development (0214.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0214.1.1 Demonstrate an awareness of FFA and its components.
0214.1.2 Utilize record-keeping skills in work-based experience programs.
0214.1.3 Develop and exhibit communication skills.
0214.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0214.1.5 Demonstrate personal and social skills.
0214.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Greenhouse Structure, Operation and Maintenance (0214.S.2)
Students will identify different greenhouse structures, operations and maintenance.

Greenhouse Structure, Operation and Maintenance Objectives
Students will:
0214.2.1 Identify different greenhouse parts and compare types of structures and coverings.
0214.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
0214.2.3 Diagram operational systems in the greenhouse operation.
0214.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Plant Classification and Identification (0214.S.3)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0214.3.1 Demonstrate an understanding of the natural classification system for the plant kingdom.
0214.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Environmental Control and Plant Growth (0214.S.4)
Students will identify the different environmental elements and plant growth.

Environmental Control and Plant Growth Objectives
Students will:
0214.4.1 Describe the plant processes involved with plant growth and development.
0214.4.2 List plant growth regulators and document their effects on plants.
0214.4.3 Explain how essential elements become available for plant use.
0214.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Greenhouse Media and Containers (0214.S.5)
Students will identify the greenhouse media effects and the different types of containers.

Greenhouse Media and Containers Objectives
Students will:
0214.5.1 Research the components of media and amendments.
0214.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
0214.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Plant Processes and Propagation (0214.S.6)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0214.6.1 Perform methods of propagating plants.
0214.6.2 Manipulate total environment from juvenile to mature plant.
0214.6.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identifying and Controlling Disease, Insects, and Weeds (0214.S.7)
Students will identify and control disease, insects and weeds with proper pesticide usage.

Disease, Insects, and Weeds Objectives
Students will:
0214.7.1 Identify and exhibit guidelines for pesticide use.
0214.7.2 Practice integrated pest management procedures.
0214.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Greenhouse Business Management (0214.S.8)
Students will identify the various types of managing a greenhouse business.

Greenhouse Business Management Objectives
Students will:
0214.8.1 Explore and discuss the various types of records kept in a greenhouse business.
0214.8.2 Use computers to solve problems related to greenhouse management.
0214.8.3 Describe the methods and determine the values and limitations of effective advertising.
0214.8.4 Develop a plan for profitable sales techniques.
0214.8.5 Record receipts and expenditures.

Standard 9: Laboratory Investigation (0214.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0214.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0214.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0214.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0214.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0214.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0214.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in greenhouse technology.
- Locate, evaluate, and collect information from a variety of sources related to greenhouse technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0214.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0214.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.

0214.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Process/Workplace Skills (0214.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0214.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0214.11.2 Explore careers available in greenhouse technology.

0214.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

0214.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0214.11.5 Demonstrate correct language usage in all oral and written work.

0214.11.6 Perform effectively in both leadership and non-leadership roles.

0214.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0214.11.8 Participate as a team member to complete a variety of assignments.

Landscape Design And Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, the students will implement the plan.

Standard 1: Leadership and Interpersonal Skill Development (0215.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0215.1.1 Participate in FFA activities.
0215.1.2 Write, deliver and evaluate a speech and/or presentation.
0215.1.3 Explore careers in the landscape industry.
0215.1.4 Determine appropriate job seeking and keeping skills.
0215.1.5 Describe ethical conduct.
0215.1.6 Utilize record-keeping skills in work-based experience programs (SAE).

Standard 2: Basic Landscape Design (0215.S.2)
Students will recognize and demonstrate basic principles of planning and implementing the landscape design.

Basic Landscape Design Objectives
Students will:
0215.2.1 Determine environmental requirements for landscape plant materials.
0215.2.2 Recognize the appropriate plants for landscape use.
0215.2.3 Interpret landscape symbols for a landscape plan.
0215.2.4 Operate computer assisted design programs.
0215.2.5 Demonstrate knowledge of drafting skills needed in a landscape plan.

Standard 3: Safe Use and Operation of Horticulture Tools and Equipment. (0215.S.3)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0215.3.1 Identify and properly use horticulture tools and equipment.
0215.3.2 Follow appropriate safety procedures and policies.
0215.3.3 Interpret and follow safety information from equipment manuals.
0215.3.4 Maintain and adjust safety devices.
0215.3.5 Service tools and equipment as to manufactures specifications.
0215.3.6 Operate equipment under job site conditions.

Standard 4: Implementation of the Landscape Design (0215.S.4)
Students will apply principles of landscape design.

Landscape Design Objectives
Students will:
0215.4.1 Prepare an area to be landscaped.
0215.4.2 Construct walkways and landscape structures.
0215.4.3 Install balled and burlapped, containerized and bare root plantings.
0215.4.4 Install herbaceous landscape plants.
0215.4.5 Place edging materials.
0215.4.6 Mulch a landscape site.
0215.4.7 Install turf areas.
0215.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. The students will understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Leadership and Interpersonal Skill Development (0216.S.1)
Students will demonstrate leadership skills through personal, organizational, and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0216.1.1 Participate in FFA activities and programs.
0216.1.2 Identify communication skills.
0216.1.3 Identify interview and employment readiness skills.
0216.1.4 Draft a resume.

Standard 2: Demonstrate Safe Use and Operation of Horticulture Tools and Equipment (0216.S.2)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0216.2.1 Identify and properly use horticulture tools and equipment.
0216.2.2 Follow appropriate safety procedures and policies.
0216.2.3 Interpret and follow safety information from equipment manuals.
0216.2.4 Maintain and adjust safety devices.
0216.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
0216.2.6 Operate equipment under job site conditions.
0216.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Using Pest Management Techniques (0216.S.3)
Students will describe safe pesticide use and the concept of integrated pest management.

Pest Management Techniques Objectives
Students will:
0216.3.1 Identify, calibrate, and properly use equipment.
0216.3.2 Identify and use personal safety equipment and protective clothing.
0216.3.3 Identify pests and the appropriate control techniques.
0216.3.4 Introduce Integrated Pest Management (IPM) techniques.
0216.3.5 Interpret pesticide labels and proper use as instructed.
0216.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Demonstrate Proper Landscape Maintenance Techniques (0216.S.4)
Students will maintain the landscape.

Landscape Maintenance Objectives
Students will:
0216.4.1 Determine and follow appropriate lawn care practices.
0216.4.2 Aerate and dethatch turf areas.
0216.4.3 Determine and implement irrigation needs for turf and landscaped areas.
0216.4.4 Identify appropriate soil testing procedures.
0216.4.5 Over-seed, lime, and fertilize as deemed necessary.
0216.4.6 Determine and implement proper pruning timelines and practices.

0216.4.7 Maintain landscape edging materials.
0216.4.8 Mulch landscape planting.
0216.4.9 Maintain landscape structures.
0216.4.10 Describe appropriate winter protection.
0216.4.11 Utilize record-keeping skills in work-based experience programs (SAE).

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.9-12.4.1 use telecommunications and online resources for the purpose of communicating with audiences inside and outside of the classroom.

Performance Descriptors (TEC.PD.9-12.4)
- **Mastery**
  High school students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report result;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.9-12.5.1 use a variety of strategies to acquire information from electronic resources;
TEC.9-12.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.9-12.5)
- **Mastery**
  High school students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems; routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.9-12.6.1 investigate and apply expert systems, intelligent agents, and simulations in real world situations.

Performance Descriptors (TEC.PD.9-12.6)
- **Mastery**
  High school students performing at the mastery level select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning.

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.

David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions.. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Note: The content standards and objectives for Technical and Adult Education do not include performance descriptors.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts, the WVEIS course code for technical courses);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1. 0101.S.1 refers to Agriculture and Natural Resources I content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology, the WVEIS code for technical courses);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses, ~~and~~ grades 11-12 science courses, and technical courses, which use no grade designation);
- The number of the content standard addressed; and

- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard. 0101.1.1 refers to Agriculture and Natural Resources I content standard #1, objective #1.

Numbering of Performance Descriptors

The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)

Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this ~~version~~ section of Policy 2520 is ~~"200112."~~ "200207, indicating that the Board approval date is ~~December 2001~~ July, 2002.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

Agriculture and Natural Resources I

This area of study is designed to provide students with core skills and competencies needed for pursuing careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Orientation to the Agriculture and Natural Resource Industries (0101.S.1)
Students will:

- describe the natural resource industry.

Agriculture and Natural Resource Industries Objectives
Students will:

0101.1.1 Identify appropriate career opportunities in agriculture and natural resources.
0101.1.2 Relate the importance of agriculture and natural resources to state, national and international economies.
0101.1.3 Identify major agricultural and natural resources issues.
0101.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Leadership in Agriculture and Natural Resources (0101.S.2)
Students will:

- show leadership skills necessary for success in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0101.2.1 Participate in meetings using parliamentary law.
0101.2.2 Use interpersonal skills in team problem solving.
0101.2.3 Prepare and deliver a brief presentation on an agricultural or natural resources topic.

Standard 3: Developing Work-Based Experience Program (0101.S.3)
Students will:

- develop work-based experience programs in agriculture and natural resources.

Developing Work-Based Experience Program Objectives
Students will:

0101.3.1 Define and explain supervised experience programs in agriculture and natural resources.
0101.3.2 Explore opportunities for work-based experiences through supervised experience programs.
0101.3.3 Define record keeping terms for supervised experience programs.
0101.3.4 Complete budgets for potential supervised experience programs.
0101.3.5 Establish a supervised experience program in agriculture or natural resources.
0101.3.6 Utilize marketing principles.
0101.3.7 Demonstrate competency in agriscience problem solving.

Standard 4: Computer Applications in Agriculture and Natural Resources (0101.S.4)
Students will:

- Display skills involving computer application in natural recourses.

Computer Applications in Agriculture and Natural Resources Objectives
Students will:

0101.4.1 Utilize keyboarding skills to operate agriculture and natural resources software.
0101.4.2 Search the Internet to secure agriculture and natural resources information.

Standard 5: Applying Basic Mechanical Skill in Agriculture and Natural Resources (0101.S.5)
Students will:

- demonstrate basic mechanical skills.

Basic Mechanical Skill in Agriculture and Natural Resources Objectives
Students will:
0101.5.1 Demonstrate principles of safety.
0101.5.2 Demonstrate basic tool conditioning skills.
0101.5.3 Demonstrate basic carpentry skills.
0101.5.4 Demonstrate basic welding skills.
0101.5.5 Demonstrate basic cold metal skills.

Standard 6: Introductory Animal Science and Production (0101.S.6)
Students will:
- demonstrate animal science and production skills.

Animal Science and Production Objectives
Students will:
0101.6.1 Explore various animal production opportunities.
0101.6.2 Explain management/health requirements of animals.
0101.6.3 Identify desirable characteristics for selecting large and small animals.
0101.6.4 Identify different types of animal digestive systems.

Standard 7: Introductory Plant Science and Production (0101.S.7)
Students will:
- demonstrate plant science and production skills.

Introductory Plant Science and Production Objectives
Students will:
0101.7.1 Explore various plant production opportunities.
0101.7.2 Explain plant production requirements (macronutrients, micronutrients, pH).
0101.7.3 Identify the major parts of a plant.
0101.7.4 Describe the function of the major parts of a plant.

Standard 8: Basic Environmental Concerns (0101.S.8)
Students will:
- demonstrate basic environmental skills.

Basic Environmental Concerns Objectives
Students will:
0101.8.1 Explain major environmental concerns - e.g. acid rain, air pollution, soil degradation and surface and groundwater pollution.
0101.8.2 Use measurement devices to collect and test soil and water samples.
0101.8.3 Explain the concepts of soil science and their relationship to agriculture.

Standard 9: Investigations and Problem Solving (0101.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0101.9.1 Engage in hands-on activities demonstrating agriscience and natural resources concepts and principles.

Agriculture and Natural Resources II

This area of study is designed to provide students with core skills and competencies needed for pursuing advanced careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Developing Work Based (0102.S.1)
Students will:

- develop a work based experience program.

Developing Work Based Objectives
Students will:

0102.1.1 Analyze records of supervised experience programs to make sound decisions for expanding.
0102.1.2 Identify marketing trends and cycles.
0102.1.3 Identify employment trends and cycles.
0102.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Computer Applications (0102.S.2)
Students will:

- utilize computer applications in agriculture and natural resources.

Computer Applications Objectives
Students will:

0102.2.1 Use computer resources to solve problems related to work-based experience programs.

Standard 3: Ecosystem Management (0102.S.3)
Students will:

- understand ecosystem management.

Ecosystem Management Objectives
Students will:

0102.3.1 Explain the impact of agriculture and forestry on ecosystems.
0102.3.2 Explain the relationship of wetlands to agriculture and natural resources.
0102.3.3 Test, interpret and analyze water and soil test data.

Standard 4: Leadership in Agriculture and Natural Resources (0102.S.4)
Students will:

- display leadership skills in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0102.4.1 Conduct meetings using parliamentary law.
0102.4.2 Serve as a small group team leader.
0102.4.3 Present prepared and extemporaneous speeches on issues affecting agriculture and natural resources.
0102.4.4 Participate in committees and leadership development activities.
0102.4.5 Participate in committee service.

Standard 5: Application of Mechanical Skills (0102.S.5)
Students will:

- apply mechanical skills to augment agriculture and natural resource activities.

Application of Mechanical Skills Objectives
Students will:
0102.5.1 Read and transfer measurements.
0102.5.2 Develop bill of materials and calculate costs.
0102.5.3 Demonstrate advanced tool conditioning skills.
0102.5.4 Demonstrate advanced welding skills.
0102.5.5 Demonstrate building construction skills.
0102.5.6 Service and maintain small engines.
0102.5.7 Apply mechanical skills in repair and construction projects related to supervised experience programs.

Standard 6: Advanced Animal Science and Production (0102.S.6)
Students will:
- demonstrate advanced animal science reproduction skills.

Advanced Animal Science and Production Objectives
Students will:
0102.6.1 Compare animal digestive systems.
0102.6.2 Analyze nutrient requirements of animals and calculate rations.
0102.6.3 Identify symptoms of nutrient deficiencies.
0102.6.4 Describe the use of feed additives and growth stimulants.
0102.6.5 Explain the role of breeding and selection in animal improvement.
0102.6.6 Recognize steps to maintain animal health.
0102.6.7 Explain biotechnology applications in animal production.

Standard 7: Advanced Plant Science and Production (0102.S.7)
Students will:
- demonstrate advanced plant science and production skills.

Advanced Plant Science and Production Objectives
Students will:
0102.7.1 Describe approved practices in plant nutrition.
0102.7.2 Identify symptoms and management strategies for plant nutrient deficiencies.
0102.7.3 Identify pest management measures.
0102.7.4 Explain biotechnology applications in plant production.

Standard 8: Forestry (0102.S.8)
Students will:
- exhibit skills enhancing selective forestry activities.

Forestry Objectives
Students will:
0102.8.1 Identify trees of major economic importance.
0102.8.2 Identify relationships among forests, wildlife and water resources.
0102.8.3 Select best management practices for timber stand improvement.

Standard 9: Investigations and Problem Solving (0102.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0102.9.1 Students will engage in advanced hands-on activities relating to agriscience and natural resources concepts.

Agriculture Mechanics I

This area of study is designed to provide learners with job entry-level skills in the agricultural mechanics industry. Major instructional concepts include an orientation to mechanics industry, leadership, safety, drawing and blueprinting, shop, hand and power tools.

Standard 1: Orientation to the Agricultural Mechanics Industry (0112.S.1)
Students will:

- describe mechanics as a career.

Agricultural Mechanics Industry Objectives
Students will:
0112.1.1 Identify various career opportunities in agricultural mechanics.
0112.1.2 Develop computer skills.
0112.1.3 Develop resume and job seeking skills.

Standard 2: Leadership in Agricultural Mechanics (0112.S.2)
Students will:

- participate effectively in a group (FFA) setting.

Leadership in Agricultural Mechanics Objectives
Students will:
0112.2.1 Define the function and history of the FFA.
0112.2.2 Identify parliamentary procedure skills need to conduct a meeting.
0112.2.3 Perform individual leadership skills in preparing and presenting a speech.
0112.2.4 Prepare and identify components of a program of activities.

Standard 3: Understanding Safety and Fire Control Procedures (0112.S.3)
Students will:

- maintain a safe working environment.

Understanding Safety and Fire Control Procedures Objectives
Students will:
0112.3.1 Utilize personal safety devices.
0112.3.2 Identify general shop safety rules.
0112.3.3 Maintaining a safe working environment.
0112.3.4 Identify and comply with safety rules relating to operation of farm tractors and equipment.

Standard 4: Understanding and Interpreting Drawing and Blueprints (0112.S.4)
Students will:

- use blueprints to plan projects.

Understanding and Interpreting Drawing and Blueprints Objectives
Students will:
0112.4.1 Apply dimensions to drawings and free hand sketches.
0112.4.2 Calculate costs and bill of materials.

Standard 5: Using Shop Hand and Power Tools (0112.S.5)
Students will:

- safely and correctly demonstrate metal fabrication.

Using Shop Hand and Power Tools Objectives
Students will:

0112.5.1 Identify and use common hand tools and power equipment.
0112.5.2 Perform cold metal procedures - cutting, drilling and threading.
0112.5.3 Perform various arc-welding functions.
0112.5.4 Perform various oxy-acetylene tasks.
0112.5.5 Conduct arc welding projects that relate to SAEs.

Standard 6: Technology Applications (0112.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0112.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0112.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0112.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural mechanics.
0112.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0112.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:

0112.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0112.7.2 Explore careers available in agricultural mechanics.
0112.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0112.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0112.7.5 Demonstrate correct language usage in all oral and written work.
0112.7.6 Perform effectively in both leadership and non-leadership roles.
0112.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0112.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0112.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives

Students will:

0112.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0112.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0112.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0112.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agricultural Mechanics II

This area of study provides students with more advanced concepts and practical application in the areas of leadership, computer application, ag engines, structures, electricity and fencing.

Standard 1: Introduction to Basic Principles of Agricultural Engines – Gasoline and Diesel (0113 .S.1)
Students will:

- **learn the basic principles of agricultural engines – gasoline and diesel.**

Gasoline and Diesel Objectives
Students will:

0113.1.1 Interpret basic principles of agricultural engines.
0113.1.2 Apply principles of tune-up procedure.
0113.1.3 Perform engine overhauls.
0113.1.4 Demonstrate problem solving in operation and maintenance of engines.
0113.1.5 Identify hydraulic systems.
0113.1.6 Identify and use diagnostic testing equipment.

Standard 2: Agricultural Structures (0113.S.2)
Students will:

- **use agriculture construction techniques.**

Agricultural Structures Objectives
Students will:

0113.2.1 Identify basic building construction techniques related to agricultural structures.
0113.2.2 Select and install appropriate fasteners.
0113.2.3 Select kinds and grades of lumber for the job.
0113.2.4 Identify roof designs and materials.
0113.2.5 Exhibit concrete and masonry skills.
0113.2.6 Identify, select and use plumbing fixtures.
0113.2.7 Select and use various painting and finishing materials.

Standard 3: Agricultural Electricity (0113.S.3)
Students will:

- **use proper safety in electrical wiring.**

Agricultural Electricity Objectives
Students will:

0113.3.1 Demonstrate electrical theory and skills with agricultural electrical units.
0113.3.2 Identify terminology, circuits, breakers, switches and service entrance panels based on state codes.
0113.3.3 Identify, select and use electric motors, motor controls, pulley sizes and speeds.
0113.3.4 Demonstrate proper safety procedures in all electrical work.

Standard 4: Fencing (0113.S.4)
Students will:

- **explore fencing for agricultural applications.**

Fencing Objectives
0113.4.1 Identify and understand the various types of fencing, tools and equipment.

0113.4.2 Analyze the economics of various fencing systems.

Standard 5: Agricultural Equipment (0113.S.5)
Students will:

- **maintain, adjust and repair agricultural equipment.**

Agricultural Equipment Objectives
Students will:

0113.5.1 Identify agricultural machinery and equipment.
0113.5.2 Perform maintenances procedures as recommended in service manuals.
0113.5.3 Identify agricultural lubricants and fuels.

Standard 6: Technology Applications (0113.S.6)
Students will:

- **apply technology to investigate real-world problems.**

Technology Applications Objectives
Students will:

0113.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0113.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0113.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to a agricultural mechanics.
0113.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of an agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0113.S.7)
Students will:

- **demonstrate personal and group workplace skills.**

Process/Workplace Skills in Agribusiness Objectives
Students will:

0113.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0113.7.2 Explore careers available in agricultural mechanics.
0113.7.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural mechanics.
0113.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0113.7.5 Demonstrate correct language usage in all oral and written work.
0113.7.6 Perform effectively in both leadership and non-leadership roles.
0113.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0113.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Lab Investigation (0113.S.8)
Students will :

- **safely conduct laboratory investigations and exploratory learning.**

Lab Investigation Objectives

Students will:

0113.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0113.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0113.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0113.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agribusiness Management

Agribusiness management is for students who seek further agriculture, business, advancement and management techniques that will enable them to become successful in owning and operating a business.

Standard 1: Agribusiness Concepts (0131.S.1)
Students will:
- Identify different types of business organizations.

Agribusiness Concepts Objectives
Students will:
0131.1.1 Identify agribusiness organizational structures.
0131.1.2 Distinguish between partnership, limited partnership and joint venture.
0131.1.3 Describe regular and sub-chapter S corporations.
0131.1.4 Explain the difference between cooperatives and corporations.

Standard 2: Agripreneurship (0131.S.2)
Students will:
- describe the risks and rewards of becoming an entrepreneur.

Agripreneurship Objectives
Students will:
0131.2.1 Define entrepreneurship.
0131.2.2 Recognize advantages and disadvantages of being self-employed.
0131.2.3 Identify personal characteristics of successful agripreneurs.
0131.2.4 Explain why businesses succeed.

Standard 3: Preparing a Business Plan (0131.S.3)
Students will:
- develop a business plan and technical resources.

Preparing a Business Plan Objectives
Students will:
0131.3.1 Identify and complete the components of a business plan.
0131.3.2 Prepare a cash flow statement for a proposed agribusiness.
0131.3.3 Identify sources of technical assistance in establishing and maintaining a successful business.
0131.3.4 Explain risk management.

Standard 4: Business Law (0131.S.4)
Students will:
- identify the basic business law involved in agriculture.

Business Law Objectives
Students will:
0131.4.1 Identify the types and sources of laws.
0131.4.2 Describe liability and negligence laws.
0131.4.3 Describe health and safety regulations.
0131.4.4 Identify legal requirements and common laws and legal documentation of a successful business operation.

Standard 5: Marketing and Sales Management (0131.S.5)
Students will:

- develop a marketing and sales plan.

Marketing and Sales Management Objectives
Students will:
0131.5.1 Develop and maintain a marketing strategy.
0131.5.2 Explain methods of advertising.
0131.5.3 Identify sources of information in using marketing research.
0131.5.4 Demonstrate successful marketing techniques.

Standard 6: Financial Management (0131.S.6)
Students will:
- develop various financial records of an agribusiness.

Financial Management Objectives
Students will:
0131.6.1 Use computers in maintaining business documents and records.
0131.6.2 Use computers to make sales and business projections.
0131.6.3 Prepare sales literature and advertisements.

Standard 7: Technology Applications in Agribusiness (0131.S.7)
Students will:
- apply technology to investigate real-world problems.

Technology Applications in Agribusiness Objectives
Students will:
0131.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0131.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0131.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0131.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 8: Process/Workplace Skills in Agribusiness (0131.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:
0131.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0131.8.2 Explore careers available in agribusiness.
0131.8.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0131.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0131.8.5 Demonstrate correct language usage in all oral and written work.
0131.8.6 Perform effectively in both leadership and non-leadership roles.
0131.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0131.8.8 Participate as a team member to complete a variety of assignments.

Agricultural Biotechnology

This course is designed to provide knowledge, skills and competencies regarding the application of biotechnology to agriscience. The course establishes a basic understanding of biotechnology, genetics, and agricultural applications and explores related careers.

Standard 1: Orientation to Biotechnology (0132.S.1)
Students will:

- research application of biotechnology in agriscience.

Biotechnology Objectives
Students will:

0132.1.1 Investigate biotechnology and its applications to agriscience.
0132.1.2 Research the biotechnology industry and make predictions regarding future uses in agriscience and the impact on the industry and consumer.

Standard 2: Genetics and Genetic Engineering (0132.S.2)
Students will:

- describe genetic engineering.

Genetics and Genetic Engineering Objectives
Students will:

0132.2.1 Define and exhibit an understanding of basic genetic terms.
0132.2.2 Explain the concept of habitability.
0132.2.3 Compare and contrast methods of transferring genetic information.
0132.2.4 Relate the concepts of dominant and recessive genes to common heritable traits.
0132.2.5 Explain and simulate recombinant DNA procedures.
0132.2.6 Explain and perform procedures used in tissue culturing.
0132.2.7 Research emerging methods of genetic engineering.
0132.2.8 Properly and safely manipulate equipment and procedures used in performing genetic engineering tasks.

Standard 3: The Application of Biotechnology to Animal Management and Reproduction (0132.S.3)
Students will:

- apply principles of biotechnology to animal production.

Animal Management and Reproduction Objectives
Students will:

0132.3.1 Apply principles of biotechnology to animal selection.
0132.3.2 Apply principles of biotechnology to animal health.
0132.3.3 Apply principles of biotechnology to the management of animal waste.
0132.3.4 Explore the application of artificial insemination in animal science.
0132.3.5 Describe the purposes and procedures of embryo transfer.
0132.3.6 Investigate and discuss the application of biotechnology to estrus manipulation.
0132.3.7 Explore developments in biotechnology regarding gender selection.

Standard 4: The Application of Biotechnology to Plant Propagation, Growth and Development (0132.S.4)
Students will:

- apply principles of biotechnology to plant production.

Plant Propagation, Growth and Development Objectives
Students will:

0132.4.1 Design, conduct, evaluate and revise experiments related to the application of biotechnology to both sexual and asexual plant propagation.
0132.4.2 Perform various tissue culturing techniques.
0132.4.3 Discuss the stages of plant growth and investigate and analyze alterations in plant growth as a result of biotechnology.
0132.4.4 Evaluate the impact of biotechnology on making plants more resistant to insects, diseases and frost.

Standard 5: Laboratory Investigation (0132.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0132.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0132.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0132.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0132.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Ethical Questions Created by Biotechnology (0132.S.6)
Students will:

- demonstrate an understanding of ethical issues associated with biotechnology.

Ethical Questions Created by Biotechnology Objectives
Students will:

0132.6.1 Examine ethical questions raised by biotechnology.
0132.6.2 Distinguish the difference between fact and opinion.

Standard 7: Leadership Development for the Biotechnology Industry (0132.S.7)
Students will:

- research and debate issues in biotechnology.

Biotechnology Industry Objectives
Students will:

0132.7.1 Obtain current information from printed sources and the Internet concerning biotechnology and evaluate for accuracy.
0132.7.2 Debate biotechnology issues.

Standard 8: Technology Applications (0132.S.8)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0132.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural biotechnology.
- Locate, evaluate, and collect information from a variety of sources related to agricultural biotechnology.
- Develop positive attitudes toward technology uses that support lifelong learning,

collaboration, personal pursuits, and productivity.

0132.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0132.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural biotechnology.

0132.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural biotechnology.

Standard 9: Process/Workplace Skills (0132.S.9)

Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives

Students will:

0132.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0132.9.2 Explore careers available in agricultural biotechnology.

0132.9.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural biotechnology.

0132.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0132.9.5 Demonstrate correct language usage in all oral and written work.

0132.9.6 Perform effectively in both leadership and non-leadership roles.

0132.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0132.9.8 Participate as a team member to complete a variety of assignments.

Agricultural Cooperative Education

This course is designed for seniors in agricultural education classes. Students must be their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and receive school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. This course will give students experience in a potential agricultural career.

- **Standard 1: Orientation (0133.S.1)**

Students will:

- prepare for employment

- **Orientation Objectives**

Students will:

0133.1.1 Determine areas of major interest in agriculture (production, agribusiness, entrepreneurship).
0133.1.2 Complete required information sheet and papers for program.
0133.1.3 Identify required policies.
0133.1.4 Establish experience program record-book procedures.
0133.1.5 Establish an appropriate training program and evaluation procedures.

- **Standard 2: Interpersonal Skill Development (0133.S.2)**

Students will:

- develop skills necessary to maintain employment.

- **Interpersonal Skill Development Objectives**

Students will:

0133.2.1 Develop an understanding of employer/employee relationships.
0133.2.2 Establish job-site ethics.
0133.2.3 Describe appropriate dress, etiquette and health habits.
0133.2.4 Determine job skills and responsibilities.
0133.2.5 Budget time effectively for job completion.
0133.2.6 Develop leadership and decision-making skills.
0133.2.7 Demonstrate a courteous attitude to customers, employers and fellow employees.
0133.2.8 Display willingness to learn new techniques and follow directions.

- **Standard 3: Job Site Safety Skills (0133.S.3)**

Students will:

- demonstrate a safety "attitude."

- **Job Site Safety Skills Objectives**

Students will:

0133.3.1 Establish a safe working environment.
0133.3.2 Obtain appropriate training from supervisor using acceptable procedures.
0133.3.3 Identify procedures for reporting safety violations.
0133.3.4 Identify the location of first aid kits, emergency phone numbers and exits.
0133.3.5 Demonstrate proper use of equipment.

- **Standard 4: Career Awareness and Employment Skills (0133.S.4)**

Students will:

- develop documents and skills to obtain employment.

- **Career Awareness and Employment Skills Objectives**

Students will:

0133.4.1 Identify areas of potential career interests.
0133.4.2 Determine contents of job application and complete a letter of application.
0133.4.3 Compose an appropriate job resume.
0133.4.4 Demonstrate job-interviewing skills.
0133.4.5 Identify methods to locate potential jobs.

- **Standard 5: Technology Applications (0133.S.5)**

Students will:

- apply technology to investigate real-world problems.

- **Technology Applications Objectives**

Students will:

0133.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0133.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0133.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0133.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

- **Standard 6: Process/Workplace Skills in Agribusiness (0133.S.6)**

Students will:

- demonstrate personal and group workplace skills.

- **Process/Workplace Skills in Agribusiness Objectives**

Students will:

0133.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0133.6.2 Explore careers available in agribusiness.
0133.6.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0133.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0133.6.5 Demonstrate correct language usage in all oral and written work.
0133.6.6 Perform effectively in both leadership and non-leadership roles.
0133.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0133.6.8 Participate as a team member to complete a variety of assignments.

- **Standard 7: Lab Investigation (0133.S.7)**

Students will:

- safely conduct laboratory investigations and exploratory learning.

- **Lab Investigation Objectives**

Students will:

0133.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0133.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0133.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0133.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

**Credit varies according to school-release time for placement. In most cases, the program will involve 2 hours/3 credits.*

Agricultural Experience Program

Students enrolled in agricultural education courses have the unique opportunity for experiential learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course code provides county school systems the vehicle whereby credit can be awarded for such individual student agricultural experiences occurring as an outgrowth from other agricultural education courses.

Standard 1: Selecting Supervised Agricultural Experience Program (0134.S.1)
Students will:

- Identify and investigate appropriate enterprises for SAE.

Supervised Agricultural Experience Program (SAE) Objectives
Students will:

0134.1.1 Define and explain the meaning and purpose of SAE.
0134.1.2 Complete a personal interest and resource inventory to identify an appropriate potential SAE.
0134.1.3 Explore and become engaged in appropriate agricultural enterprises through placement and/or entrepreneurship.

Standard 2: Maintaining Supervised Agricultural Experience Program Records (0134.S.2)
Students will:

- accurately maintain SAE records.

Supervised Agricultural Experience Program Records Objectives
Students will:

0134.2.1 Explain the types of records utilized in agricultural enterprises.
0134.2.2 Define and demonstrate the use of net worth statements, inventories, income and expense logs and other pertinent financial records.
0134.2.3 Maintain neat and accurate records for individual SAEs.

Standard 3: Evaluating and Improving Supervised Agriculture Experience Program (0134.S.3)
Students will:

- summarize and evaluate progress in individual SAEs.

Evaluating and Improving Supervised Agriculture Experience Program Objectives
Students will:

0134.3.1 Summarize financial records to determine net income from the SAE.
0134.3.2 Calculate efficiency factors related to individual SAEs.
0134.3.3 Explore opportunities for SAE expansion and/or improvement.
0134.3.4 Research and examine career opportunities related to individual SAEs.

Agriscience 11

This area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, and leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Agricultural Buildings And Equipment (0135.S.1)
Students will:

- apply agricultural mechanical skills in solving agriscience problems.

Agricultural Buildings and Equipment Objectives
Students will:

0135.1.1 Compare and contrast fencing systems, materials, tools and management practices.
0135.1.2 Analyze and discuss types of agricultural buildings and related construction.
0135.1.3 Interpret agricultural equipment service manuals and maintenance schedules.
0135.1.4 Perform basic transit procedures.

Standard 2: Pesticide Safety and Management (0135.S.2)
Students will:

- describe basic pesticide safety.

Pesticide Safety and Management Objectives
Students will:

0135.2.1 Investigate and discuss pesticide types and pest control.
0135.2.2 Examine control methods, chemical formulation and equipment used to control pests in the greenhouse.
0135.2.3 Identify information on a pesticide label.
0135.2.4 Explore the safe handling and disposal of pesticides.
0135.2.5 Identify and perform the steps in calibrating a sprayer.
0135.2.6 Research integrated pest management.

Standard 3: Health and Care of Farm Related Animals (0135.S.3)
Students will:

- explain how to maintain animal health.

Health and Care of Farm Related Animals Objectives
Students will:

0135.3.1 Investigate and discuss the symptoms of unhealthy animals.
0135.3.2 Identify and diagnose symptoms of disease and parasites.
0135.3.3 Analyze the treatment and prevention of animal disease.
0135.3.4 Utilize techniques in administering medicine and immunizing.
0135.3.5 Examine the treatment and prevention of animal parasites.
0135.3.6 Identify and illustrate the methods for administering medicines to animals.
0135.3.7 Design and utilize a herd health program.
0135.3.8 Differentiate between animal welfare and animal rights.

Standard 4: Work-based Experiential Programs (Supervised Agricultural Experience Programs) (0135.S.4)
Students will:

- conduct work-based experience programs.

Work-based Experiential Programs Objectives
Students will:
0135.4.1 Complete and summarize record book enterprises related to students Supervised Agricultural Experience Program.
0135.4.2 Calculate efficiency factors related to students Supervised Agricultural Experience Program.

Standard 5: Managing Farm Woodlots (0135.S.5)
Students will:
- describe farm woodlot management.

Managing Farm Woodlots Objectives
Students will:
0135.5.1 Compare and contrast the methods of identifying trees.
0135.5.2 Identify trees common to West Virginia.
0135.5.3 Evaluate major forest type and primary uses.
0135.5.4 Measure tree height and diameter.
0135.5.5 Identify and utilize units of measurement (mile, rod, chair & acre).
0135.5.6 Calculate the number of acres in a timber tract.
0135.5.7 Examine the habitat necessary for wildlife.

Standard 6: Laboratory Investigations/Hands-on Learning (0135.S.6)
Students will:
- safely conduct laboratory investigation and exploratory learning.

Laboratory Investigations/hands-on Learning Objectives
Students will:
0135.6.1 Engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0135.6.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0135.6.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0135.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 7: Leadership Development in Agriscience (0135.S.7)
Students will:
- display leadership skills in Agriscience

Leadership Development in Agriscience Objectives
Students will:
0135.7.1 Conduct meetings using parliamentary law.
0135.7.2 Serve as a small group team leader.
0135.7.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0135.7.4 Engage in committees and leadership development activities.
0135.7.5 Model and exhibit community service.

Standard 8: Principles of Safety (0135.S.8)
Students will:
- demonstrate principles of safety.

Principles of Safety Objectives
Students will:
0135.8.1 Wear appropriate protective gear.
0135.8.2 Maintain a safe working environment.
0135.8.3 Identify and engage in safety practices on the farm and in the work place.

Standard 9: Technology Applications (0135.S.9)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0135.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agriscience.
- Locate, evaluate, and collect information from a variety of sources related to agriscience.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0135.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0135.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agriscience.

0135.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agriscience.

Standard 10: Process/Workplace Skills (0135.S.10)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0135.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0135.10.2 Explore careers available in agriscience.

0135.10.3 Use a variety of sources to investigate the educational requirements of various careers in agriscience.

0135.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0135.10.5 Demonstrate correct language usage in all oral and written work.

0135.10.6 Perform effectively in both leadership and non-leadership roles.

0135.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0135.10.8 Participate as a team member to complete a variety of assignments.

Agriscience 12

The area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Appling Agriculture Mechanic Skills (0136.S.1)
Students will:

- apply agriculture mechanic skills in solving problems in agriscience.

Appling Agriculture Mechanic Skills Objectives
Students will:

0136.1.1 Tune-up and perform maintenance procedures on agricultural engine driven machines.
0136.1.2 Perform basic electrical wiring skills.
0136.1.3 Adjust and maintain hay equipment.
0136.1.4 Form, mix, pour and finish concrete.

Standard 2: Land Use Capabilities and Soil Conservation (0136.S.2)
Students will:

- demonstrate land use capabilities and soil conservation in agriscience.

Land Use Capabilities and Soil Conservation Objectives
Students will:

0136.2.1 Evaluate and classify soils according to land use factors.
0136.2.2 Define and determine physical properties of soil.
0136.2.3 Recommend land use and soil conservation practices.
0136.2.4 Test soil and analyze fertility recommendations.
0136.2.5 Explain the function and management of soil pH.
0136.2.6 Describe the process of soil testing.
0136.2.7 Interpret and apply data generated by soil testing.

Standard 3: Landscape Design and Turfgrass Management (0136.S.3)
Students will:

- engage in activities in landscape design and turfgrass management.

Landscape Design and Turfgrass Management Objectives
Students will:

0136.3.1 Identify turfgrass species, purposes and desired locations.
0136.3.2 Explain steps for turfgrass establishment.
0136.3.3 Calculate fertilizer application rates.
0136.3.4 Identify common turf insects, weeds, diseases and biological control.
0136.3.5 Identify ornamental tree and shrubs.
0136.3.6 Select trees and shrubs for appropriate landscape use.
0136.3.7 Install and maintain landscape plant materials.

Standard 4: Animal Reproduction (0136.S.4)
Students will:

- display a working knowledge of animal reproduction.

Animal Reproduction Objectives
Students will:
0136.4.1 Describe genetic principles of animal breeding.
0136.4.2 Identify parts of the male and female reproductive tracts.
0136.4.3 Explain the estrus cycle and gestation period of farm animals.
0136.4.4 Describe techniques of artificial insemination, embryo transplant and pregnancy testing.
0136.4.5 Select breeding stock using performance test data.
0136.4.6 Identify biotechnology implications for animal production.

Standard 5: Farm and Agribusiness Financing (0136.S.5)
Students will:
- engage in activities to augment the understanding of farm and agribusiness financing.

Farm and Agribusiness Financing Objectives
Students will:
0136.5.1 Describe the economic principles of supply and demand.
0136.5.2 Identify sources of credit.
0136.5.3 Calculate simple interest on a loan.
0136.5.4 Explain income tax requirements.
0136.5.5 Identify the functions of government agricultural agencies and programs.
0136.5.6 Describe the steps in planning an agribusiness.

Standard 6: Employment Skills (0136.S.6)
Students will:
- conduct activities designed to enhance employment skills.

Employment Skills Objectives
Students will:
0136.6.1 Identify personal traits necessary to secure and maintain a job.
0136.6.2 Initiate a job search.
0136.6.3 Develop a resume.
0136.6.4 Complete a job application.
0136.6.5 Participate in simulated job interviews.

Standard 7: Work Based Experience (0136.S.7)
Students will:
- conduct activities designed to enhance employment skills.

Work Based Experience Objectives
Students will:
0136.7.1 Complete and summarize record book enterprises related to students supervised agricultural experience program.
0136.7.2 Calculate efficiency factors related to students supervised agricultural experience program.

Standard 8: Computer Application (0136.S.8)
Students will:
- engage in computer applications in agriscience.

Computer Application Objectives
Students will:
0136.8.1 Use computer resources to solve problems related to work-based experience programs.

Standard 9: Leadership in Agriscience (0136.S.9)
Students will:

- develop leadership skills in agriscience.

Leadership in Agriscience Objectives
Students will:
0136.9.1 Conduct meetings using parliamentary law.
0136.9.2 Serve as a small group team leader.
0136.9.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0136.9.4 Participate in committee and leadership development activities.
0136.9.5 Participate in community services.

Standard 10: Safety (0136.S.10)
Students will:
- demonstrate principles of safety.

Safety Objectives
Students will:
0136.9.1 Wear appropriate protective gear.
0136.9.2 Maintain a safe working environment.
0136.9.3 Identify safety practices on the farm and in the work place.

Animal And Veterinary Science – Large Animals

This course is designed to give students advanced knowledge of veterinary science, which includes the study of large farm animals (horses, cattle, sheep, goats and swine). This course will provide an understanding of breeds, animal health, nutrition, anatomy and physiology, training, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of large animals and their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0137.S.1)
Students will participate in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0137.1.1 Participate in committee and leadership development activities associated with FFA.
0137.1.2 Complete and summarize records of SAE Program and health program on individual animals.
0137.1.3 Shadow appropriate career opportunities in Veterinary Medicine.
0137.1.4 Initiate a job search and complete application for entry into college level programs in Veterinary Science.
0137.1.5 Develop communication skills through prepared and extemporaneous speaking.

Standard 2: History And Selection of Farm Animals (0137.S.2)
Students will examine the history and selection of farm animals.

History and Selection of Farm Animals Objectives
Students will:
0137.2.1 Trace the history of domestic farm animals and relate it to human and animal health.
0137.2.2 Classify farm animals according to purposes/use.
0137.2.3 Identify breeds of large animals (horses, cattle, sheep, goats, swine).
0137.2.4 Relate the characteristics of breeds to methods of selection.

Standard 3: Handling and Restraint (0137.S.3)
Students will demonstrate safe methods for handling and restraining farm animals.

Handling and Restraint Objectives
Students will:
0137.3.1 Identify and use tools related to handling and restraint of large animals.
0137.3.2 Demonstrate methods of techniques used in restraint of large animals.
0137.3.3 Utilize basic commands and animal behavior methods to control animals.
0137.3.4 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0137.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0137.4.1 Utilize safety practices in grooming and clipping large animals.
0137.4.2 Identify and utilize tools pertinent to the grooming, brushing and bathing of large animals.
0137.4.3 Demonstrate the ability to follow post-operative care and management of animals.

Standard 5: Anatomy and Physiology (0137.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:

0137.5.1 Identify the major parts and examine the functions of the skeletal system.
0137.5.2 Identify the major parts and examine the functions of the muscular system.
0137.5.3 Identify the major parts and examine the functions of the nervous system.
0137.5.4 Identify the major parts and examine the functions of the endocrine system.
0137.5.5 Identify the major parts and examine the functions of the respiratory system.
0137.5.6 Identify the major parts and examine the functions of the circulatory system.
0137.5.7 Identify the major parts and examine the functions of the reproductive system.
0137.5.8 Identify the major parts and examine the functions of the excretory system.
0137.5.9 Identify the major parts and examine the functions of the digestive system.
0137.5.10 Compare and contrast ruminant and monogastric systems.
0137.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0137.S.6)
Students will display a working knowledge of managing animal health.

Animal Health and Management Objectives
Students will:

0137.6.1 Determine the type of care and housing facilities needed for large animals.
0137.6.2 Examine mechanical injury and perform basic first aid requirements for large farm animals.
0137.6.3 Identify signs/symptoms of disease, as well as prevention and treatment of large animals.
0137.6.4 Utilize techniques in administering medicine and immunizing large farm animals.
0137.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies used with a large farm animal.
0137.6.6 Recognize relationships between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0137.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0137.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0137.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0137.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0137.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0137.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis of large animals.
0137.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic and field operations.
0137.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0137.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:

0137.8.1 Define, discuss and utilize terms associated with large animal nutrition.
0137.8.2 List and describe the basic nutrients and their functions.

0137.8.3 Analyze feed labels and determine the nutritional value of feeds and feedstuffs.
0137.8.4 Recognize signs of nutritional deficiencies.
0137.8.5 Analyze feeding and care requirements for maintaining pregnancy of large animals.

Standard 9: Marketing
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0137.9.1 Record data and complete information required by law and regulations in the management of large animals.
0137.9.2 Calculate and analyze cost of owning and operating a large animal health clinic.

Standard 10: Technology Applications (0137.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0137.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0137.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0137.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0137.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0137.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0137.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0137.11.2 Explore careers available in animal science.
0137.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0137.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0137.11.5 Demonstrate correct language usage in all oral and written work.
0137.11.6 Perform effectively in both leadership and non-leadership roles.
0137.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0137.11.8 Participate as a team member to complete a variety of assignments.

Animal And Veterinary Science – Small Animals

This agricultural science course is designed to give students a working knowledge of veterinary science through the study of many animals including dogs, cats, birds, reptiles and other pets. This course will provide an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of animals along with their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0138.S.1)
Students will become involved in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0138.1.1 Demonstrate an awareness of FFA and its components.
0138.1.2 Utilize record-keeping skills in work-based experience programs.
0138.1.3 Research appropriate career opportunities in veterinary medicine.
0138.1.4 Draft a resume, fill out a job application, demonstrate job seek/keep and computer skills.
0138.1.5 Develop and exhibit personal relation and communication skills.
0138.1.6 Demonstrate an awareness of employment and animal welfare ethics.

Standard 2: History and Selection of Small Animals (0138.S.2)
Students will examine the history and selection of small animals.

History and Selection of Small Animals Objectives
Students will:
0138.2.1 Trace the history of domestic animals and relate it to human and animal health.
0138.2.2 Classify small animals according to purposes/use.
0138.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0138.2.4 Examine the characteristics of small animals and incorporate into laboratory experimentation and disease evaluation.

Standard 3: Handling and Restraint (0138.S.3)
Students will demonstrate safe methods for handling and restraining small animals.

Handling and Restraint Objectives
Students will:
0138.3.1 Identify and use tools related to handling and restraint of small animals.
0138.3.2 Demonstrate methods and techniques used in restraint of small animals.
0138.3.3 Develop a basic understanding of animal behavior.
0138.3.4 Demonstrate the ability to follow post-operative care and management of animals.
0138.3.5 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0138.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0138.4.1 Utilize safety practices in grooming and clipping small animals.
0138.4.2 Identify and use animal grooming tools.
0138.4.3 Demonstrate an awareness of grooming practices (bathing, clipping, nail trimming, combing/brushing).
0138.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0138.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:
0138.5.1 Identify the major parts and examine the functions of the skeletal system.
0138.5.2 Identify the major parts and examine the functions of the muscular system.
0138.5.3 Identify the major parts and examine the functions of the nervous system.
0138.5.4 Identify the major parts and examine the functions of the endocrine system.
0138.5.5 Identify the major parts and examine the functions of the respiratory system.
0138.5.6 Identify the major parts and examine the functions of the circulatory system.
0138.5.7 Identify the major parts and examine the functions of the reproductive system.
0138.5.8 Identify the major parts and examine the functions of the excretory system.
0138.5.9 Identify the major parts and examine the functions of the digestive system.
0138.5.10 Compare and contrast ruminant and monogastric systems.
0138.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0138.S.6)
Students will describe the principles of managing animal health.

Animal Health and Management Objectives
Students will:
0138.6.1 Determine the type of care and housing facilities needed.
0138.6.2 Examine mechanical injury and perform basic first aid.
0138.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0138.6.4 Utilize techniques in administering medicine and immunizing.
0138.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies.
0138.6.6 Recognize relationship between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0138.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0138.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0138.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0138.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0138.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0138.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis.
0138.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic.
0138.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0138.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:
0138.8.1 Define, discuss and utilize terms associated with nutrition.

0138.8.2 List and describe the basic nutrients and their functions.
0138.8.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0138.8.4 Recognize signs of nutritional deficiencies.
0138.8.5 Analyze feeding and care requirements throughout life cycle and pregnancy.

Standard 9: Marketing (0138.S.9)
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0138.9.1 Research types of laws, regulations and licenses as needed in a veterinarian clinic.
0138.9.2 Calculate and analyze costs of owning and operating an animal care business.

Standard 10: Technology Applications (0138.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0138.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0138.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0138.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0138.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0138.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0138.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0138.11.2 Explore careers available in animal science.
0138.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0138.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0138.11.5 Demonstrate correct language usage in all oral and written work.
0138.11.6 Perform effectively in both leadership and non-leadership roles.
0138.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0138.11.8 Participate as a team member to complete a variety of assignments.

Animal Processing

This course is designed to provide students with basic knowledge and skills in meat processing occupations. Students will be able to exhibit these skills in the areas of sanitation and safety, slaughtering, processing and retailing, job seek/keep skills and microcomputer applications.

Standard 1: Leadership (0139.S.1)
Students will:

- demonstrate skills necessary to be employed.

Leadership Objectives
Students will:

0139.1.1 Participate in FFA activities.
0139.1.2 Write, deliver and evaluate a speech and/or oral presentation.
0139.1.3 Explore careers in processing.
0139.1.4 Determine appropriate job seek/keep skills.
0139.1.5 Demonstrate knowledge of ethical conduct in the workplace.

Standard 2: Sanitation/Safety (0139.S.2)
Students will:

- safely handle meat products.

Sanitation/Safety Objectives
Students will:

0139.2.1 List USDA sanitary practices relating to personal hygiene, sanitization of equipment and maintenance of facilities.
0139.2.2 Explain safe methods of handling tools, equipment and livestock in processing and slaughtering.
0139.2.3 Identify proper temperatures and time periods for storage and handling of fresh and frozen meat and meat products.
0139.2.4 Identify proper storage and handling techniques for consumables and by-products.

Standard 3: Slaughtering (0139.S.3)
Students will:

- demonstrate slaughtering procedures.

Slaughtering Objectives
Students will:

0139.3.1 List common breeds, USDA classes and grades of live cattle, sheep and swine.
0139.3.2 Demonstrate how to yield and quality grade hanging carcasses.
0139.3.3 Describe humane processes for stunning and bleeding animals.
0139.3.4 Properly skin, eviscerate and split carcasses of cattle.
0139.3.5 Skin or scald and scrape, eviscerate and split pork carcasses.
0139.3.6 Skin, fist and eviscerate lamb and mutton carcasses.
0139.3.7 Compute dressing percentage, percent shrink, return on offal and slaughter cost.
0139.3.8 Properly weigh and mark carcasses.

Standard 4: Processing (0139.S.4)
Students will:

- prepare retail meat products.

Processing Objectives
Students will:

0139.4.1 Identify primal cuts of beef, pork and lamb.
0139.4.2 Break carcasses into primal cuts.
0139.4.3 Identify retail cuts of beef, pork and lamb.
0139.4.4 Identify common boneless cuts of boxed beef and pork.
0139.4.5 Cut primal cuts and boxed products into various retail cuts.
0139.4.6 List methods of value added processing (grinding, curing, smoking, pre-cooking) and packaging of beef pork and lamb

Standard 5: Retailing (0139.S.5)
Students will:

- utilize merchandise product for customers.

Retailing Objectives
Students will:
0139.5.1 Prepare attractive displays of meat and meat products.
0139.5.2 Demonstrate knowledge and skills in customer relations.
0139.5.3 Exhibit an understanding of retail value; trim loss, shelf life and seasonal demand as related to pricing of products.

Standard 6: Technology Applications (0139.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0139.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal processing.
- Locate, evaluate, and collect information from a variety of sources related to animal processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0139.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0139.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal processing.
0139.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal processing.

Standard 7: Process/Workplace Skills (0139.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0139.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0139.7.2 Explore careers available in animal processing.
0139.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0139.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0139.7.5 Demonstrate correct language usage in all oral and written work.
0139.7.6 Perform effectively in both leadership and non-leadership roles.

0139.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0139.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0139.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0139.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0139.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0139.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0139.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Animal Science And Production

This agriculture science course is designed to give students a working knowledge of the commercial livestock industry, which includes beef, sheep, swine, horses, goats, dairy and poultry. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection, and economic and marketing principles related to employment. Students will develop a working knowledge of land use and livestock production to maintain an economical level of production. Upon completion of this course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0140.S.1)
Students will develop leadership skills.

Leadership Objectives
Students will:
0140.1.1 Describe FFA and its components.
0140.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0140.1.3 Identify careers in the animal industry.
0140.1.4 Identify employability skills.
0140.1.5 Develop personal relation and communication skills.
0140.1.6 Describe employment and animal welfare ethics.

Standard 2: History and Selection of Animals (0140.S.2)
Students will provide background information and describe characteristics of animals.

History and Selection of Animals Objectives
Students will:
0140.2.1 Relate the history of domestic animals to modern animal production.
0140.2.2 Describe and classify small animals according to purpose/use.
0140.2.3 Identify breeds of animals.
0140.2.4 Relate the characteristics of breeds to methods of selection (beef, sheep, swine, horses, goats, dairy and poultry).

Standard 3: Handling and Restraint (0140.S.3)
Students will demonstrate safe handling and restraining techniques.

Handling and Restraint Objectives
Students will:
0140.3.1 Identify and use tools related to handling/restraint of animals.
0140.3.2 Identify methods and techniques used in modern husbandry practices.
0140.3.3 Describe techniques in grooming and showing livestock.
0140.3.4 Describe safety practices for managing and handling livestock.

Standard 4: Animal Health and Management (0140.S.4)
Students will demonstrate animal health and management skills.

Animal Health and Management Objectives
Students will:
0140.4.1 Determine the type of care and housing facilities needed for livestock.
0140.4.2 Describe mechanical injury and treatment requirements.
0140.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0140.4.4 Utilize techniques in administering medicine and immunizing.
0140.4.5 Design and utilize a herd health program in livestock production.

Standard 5: Anatomy and Physiology (0140.S.5)
Students will utilize the fundamentals of anatomy and physiology in the commercial production of livestock.

Anatomy and Physiology Objectives
Students will:

0140.5.1 Identify the major parts and functions of the anatomy of various types of livestock.
0140.5.2 Identify the major parts and functions of the digestive system.
0140.5.3 Identify the major parts and functions of the reproductive system.
0140.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to livestock management.
0140.5.5 Identify and explain modern livestock breeding techniques.
0140.5.6 Analyze and explain data utilizing genotypic information to form a superior livestock program.

Standard 6: Nutrition (0140.S.6)
Students will describe the role of nutrition in animal production.

Nutrition Objectives
Students will:

0140.6.1 Define terms associated with nutrition.
0140.6.2 List and describe the basic nutrients and their functions.
0140.6.3 Balance rations and determine the nutritional value of feeds and feedstuffs.
0140.6.4 Identify signs of nutritional deficiencies.
0140.6.5 Identify feeding and care requirements throughout life cycle and pregnancy of livestock.
0140.6.6 Identify and design various forage management programs for economical livestock production

Standard 7: Marketing (0140.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:

0140.7.1 Research and study various livestock marketing techniques.
0140.7.2 Identify transportation and safety methods for livestock handling.
0140.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0140.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Technology Applications (0140.S.8)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0140.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science and production.
- Locate, evaluate, and collect information from a variety of sources related to animal science and production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0140.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0140.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal science and production.
0140.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science and production.

Standard 9: Process/Workplace Skills (0140.S.9)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0140.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0140.9.2 Explore careers available in animal science.
0140.9.3 Use a variety of sources to investigate the educational requirements of various careers in animal and science production.
0140.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0140.9.5 Demonstrate correct language usage in all oral and written work.
0140.9.6 Perform effectively in both leadership and non-leadership roles.
0140.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0140.9.8 Participate as a team member to complete a variety of assignments.

Standard 10: Laboratory Investigation (0140.10)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0140.10.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0140.10.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0140.10.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0140.10.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Aquaculture

This course of study is designed to provide experiential knowledge, skills and entrepreneurial competencies needed to enter various occupations in aquaculture and other scientific fields within aquaculture. This course integrates curricula of biology, physics, earth science and chemistry in producing aquatic species.

Standard 1: Orientation to the Aquaculture Industry (0141.S.1)
Students will examine the role of aquaculture in state, national and international economies.

Aquaculture Industry Objectives
Students will:
0141.1.1 Explore the role of aquaculture in the past, present and future.
0141.1.2 Relate the importance of aquaculture to state, national, and international economies.
0141.1.3 Examine employment trends and cycles related to aquaculture.

Standard 2: Leadership Development in Aquaculture (0141.S.2)
Students will participate in activities to develop leadership in the aquaculture industry.

Leadership Development in Aquaculture Objectives
Students will:
0141.2.1 Present prepared and extemporaneous speeches on issues concerning the aquaculture industry.
0141.2.2 Participate in community service.
0141.2.3 Demonstrate problem solving and decision making skills.
0141.2.4 Conduct meetings using parliamentary law.

Standard 3: Production Systems in Aquaculture (0141.S.3)
Students will design, establish and maintain aquaculture systems.

Production Systems in Aquaculture Objectives
Students will:
0141.3.1 Identify components of an aquaculture system and calculate water volumes, flow rates, solubility, density, etc.
0141.3.2 Research appropriate species for closed and flow-through systems.
0141.3.3 Explain basic animal management requirements for warm and cold-water species.
0141.3.4 Investigate and discuss factors that influence site selection.
0141.3.5 Using a bill of materials, design and/or construct a closed system.

Standard 4: Developing Work-based Experiential Programs (Supervised Agricultural Experience Programs) in Aquaculture (0141.S.4)
Students will explore entrepreneurial and employment opportunities in aquaculture.

Aquaculture Objectives
Students will:
0141.4.1 Define and explain the different supervised experience programs that are available in aquaculture.
0141.4.2 Prepare a business plan for implementation.
0141.4.3 Explore careers associated within the aquaculture industry.
0141.4.4 Create and demonstrate the key aspects of a marketing plan.
0141.4.5 Demonstrate different ways a fish can be processed.

Standard 5: Anatomy and Physiology (0141.S.5)
Students will identify and explain functions and disorders of body systems in aquatic species.

Anatomy and Physiology Objectives
Students will:
0141.5.1 Identify and explain the functions of body systems in aquatic species.
0141.5.2 Explain the process of spawning.
0141.5.3 Distinguish common fish health problems in closed systems.
0141.5.4 Investigate the role of breeding and selection in genetic improvement.

Standard 6: Nutrition (0141.S.6)
Students will describe nutrition affecting aquatic species.

Nutrition Objectives
Students will:
0141.6.1 Identify and compare common types of feed.
0141.6.2 Calculate feed rates.
0141.6.3 Calculate feed conversion.
0141.6.4 Calculate feed efficiency.
0141.6.5 Describe the nutritional needs of fish at different stages of growth.

Standard 7: Water Chemistry and its Relationship to Aquaculture (0141.S.7)
Students will perform water quality procedures and rebate results to performance of aquatic species.

Water Chemistry Objectives
Students will:
0141.7.1 Explain water quality parameters.- pH, Oxygen level, nitrates, nitrates, etc.
0141.7.2 Demonstrate sampling and testing techniques.
0141.7.3 Design a wastewater management system.

Standard 8: Safety in Aquaculture Laboratories (0141.S.8)
Students will demonstrate principles of safety in aquaculture.

Aquaculture Laboratories Objectives
Students will:
0141.8.1 Maintain a safe working environment in the aquaculture laboratory.
0141.8.2 Demonstrate and apply laboratory safety in aquaculture settings.

Standard 9: Laboratory Practices and Procedures/Hands-on Learning (0141.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Practices and Procedures Objectives
Students will:
0141.9.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0141.9.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0141.9.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0141.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 10: Technology Applications in Aquaculture (0141.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications in Aquaculture Objectives
Students will:

0141.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in aquaculture.
- Locate, evaluate, and collect information from a variety of sources related to aquaculture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0141.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.

0141.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to aquaculture.

0141.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of aquaculture.

Standard 10: Process/workplace Skills and Aquaculture (0141.S.10)
Students will demonstrate personal and group workplace skills.

Workplace Skills Objectives
Students will:

0141.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0141.11.2 Explore careers available in aquaculture.

0141.11.3 Use a variety of sources to investigate the educational requirements of various careers in aquaculture and related sciences.

0141.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0141.11.5 Demonstrate correct language usage in all oral and written work.

0141.11.6 Perform effectively in both leadership and non-leadership roles.

0141.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0141.11.8 Participate as a team member to complete a variety of assignments.

Computers In Agriculture

This course is designed to expose students to computer programming, software and applications and graphical and electronic information technology as it relates to the agriculture industry. Students will be able to utilize computers and related technology in desktop publishing, record-keeping, agricultural production, agribusiness and telecommunications. Students will also relate these applications to potential occupations within the computer technology field.

Standard 1: Word Processing and Communications (0142.S.1)
Students will demonstrate skills involving word processing in agriculture.

Word Processing and Communications Objectives
Students will:
0142.1.1 Prepare documents using word processing software.
0142.1.2 Utilize keyboarding skills for preparing reports and letters.
0142.1.3 Improve writing skills through the use of grammatical aids.
0142.1.4 Utilize data management systems.

Standard 2: Spreadsheet Applications (0142.S.2)
Students will use agricultural data in computer-based spreadsheets.

Spreadsheet Applications Objectives
Students will:
0142.2.1 Use software programs to integrate mathematical functions into agricultural production and agribusiness systems.
0142.2.2 Manipulate numerical data as it relates to cost benefit analysis.
0142.2.3 Prepare budgets, financial statements, income reports and production records.
0142.2.4 Complete applications relating to work-based experiences (Supervised Agricultural Experience Programs).

Standard 3: Graphical Presentations (0142.S.3)
Students will utilize graphical presentation software.

Graphical Presentations Objectives
Students will:
0142.3.1 Utilize graphic based software for presentations.
0142.3.2 Prepare visual aids for communicative demonstrations.

Standard 4: Electronic Information Systems (0142.S.4)
Students will demonstrate skills involving electronic information systems.

Electronic Information Systems Objectives
Students will:
0142.4.1 Utilize telecommunications resources in writing documents, manipulating data and transmitting information.
0142.4.2 Retrieve data from agricultural networks.
0142.4.3 Investigate product-marketing principles using computer technology.
0142.4.4 Integrate computer technology into agricultural production systems through the use of remote control and remote sensor science.
0142.4.5 Explore Global Positioning Satellite applications in agriculture.

Standard 5: Agricultural Journalism and Desktop Publishing (0142.S.5)
Students will produce agricultural publications.

Agricultural Journalism and Desktop Publishing Objectives
Students will:

0142.5.1 Prepare newspaper and magazine articles for publishing.
0142.5.2 Manufacture flyers, programs and booklets using graphic software.
0142.5.3 Design a template for printing books, articles and programs.

Standard 6: Process/Workplace Skills (0142.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0142.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0142.6.2 Explore careers available in computer technology.
0142.6.3 Use a variety of sources to investigate the educational requirements of various careers in computer technology.
0142.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0142.6.5 Demonstrate correct language usage in all oral and written work.
0142.6.7 Perform effectively in both leadership and non-leadership roles.
0142.6.8 Evaluate information for reliability, completeness, and applicability to various assignments.
0142.6.9 Participate as a team member to complete a variety of assignments.

Environmental Technology

This class will cover various aspects of environmental science applications to prevent detrimental effects on our ecosystem. Units will include solid and hazardous waste, water purification, wastewater treatment, solid erosion control, nutrient management and environmental surveying.

Standard 1: Solid Waste (0143.S.1)
Students will identify solid waste.

Solid Waste Objectives
Students will:
0143.1.1 Analyze sources of solid waste.
0143.1.2 Examine hazards in solid waste materials and disposal.
0143.1.3 Compare and contrast methods of solid waste disposal.
0143.1.4 Explain and participate in recycling.
0143.1.5 Describe composting.
0143.1.6 Explore methods and benefits of composting.

Standard 2: Hazardous Waste (0143.S.2)
Students will identify hazardous waste materials.

Hazardous Waste Objectives
Students will:
0143.2.1 Identify types of hazardous waste.
0143.2.2 Describe ecotoxicology.
0143.2.3 Explain hazardous waste disposal.
0143.2.4 Explain safety procedures and simulate clean up of spills.

Standard 3: Water Purification (0143.S.3)
Students will identify water purification.

Water Purification Objectives
Students will:
0143.3.1 Describe the composition of water.
0143.3.2 Explain the importance of water.
0143.3.3 Identify sources of water.
0143.3.4 Investigate and discuss how water is stored and distributed.
0143.3.5 Research how water is used and managed.
0143.3.6 Name and distinguish various types of wetlands.
0143.3.7 Explore the benefits and function of wetlands.
0143.3.8 Analyze how human action affects wetlands.

Standard 4: Wastewater Treatment and Disposal (0143.S.4)
Students will identify wastewater treatments and disposals.

Wastewater Treatment and Disposal Objectives
Students will:
0143.4.1 Identify sources of wastewater.
0143.4.2 Describe hazards in wastewater.
0143.4.3 Compare and contrast ways of treating wastewater.
0143.4.4 Research the products of wastewater treatment, including the production and use of biosolids.
0143.4.5 Recognize and investigate the important biological, chemical, and biogeochemical processes in wastewater treatment.

0143.4.6 Explain the components and operation of a wastewater treatment system.

Standard 5: Soil Erosion Control (0143.S.5)
Students will identify soil erosion.

Soil Erosion Control Objectives
Students will:
0143.5.1 Identify and describe the physical properties of soil and their impact on soil erosion.
0143.5.2 Compare and contrast types of soil erosion.
0143.5.3 Illustrate soil conservation practices for urban and agricultural areas.
0143.5.4 Utilize a soil survey to make environmental decisions.
0143.5.5 Explain the best management practices to control sediment from urban areas, agriculture and forests.
0143.5.6 Examine soil erosion control devices.

Standard 6: Nutrition Management (0143.S.6)
Students will identify nutritional management of soil.

Nutrition Management Objectives
Students will:
0143.6.1 Investigate and discuss non-point source pollution.
0143.6.2 Utilize soil nutrient testing procedures to determine available nutrients.
0143.6.3 Utilize nutrient testing procedures to determine organic matter content.
0143.6.4 Complete a nutrient management plan.
0143.6.5 Calibrate a nutrient spreader for rate of application.
0143.6.6 Perform water-testing procedures and interpret results to determine impacts of non-point source pollution.

Standard 7: Environmental Surveying (0143.S.7)
Students will identify the trade of environmental surveying.

Environmental Surveying Objectives
Students will:
0143.7.1 Demonstrate basic surveying skills.
0143.7.2 Utilize topographical maps to make environmental decisions.
0143.7.3 Apply design principles to pond and wetland construction, sediment basins, and other similar structures.
0143.7.4 Identify and accurately utilize surveying equipment.

Standard 8: Leadership (0143.S.8)
Students will participate in related activities.

Leadership Objectives
Students will:
0143.8.1 Participate in WV Envirothon and other activities related to the curriculum.
0143.8.2 Utilize Internet World Wide Net to explore specialty areas in horticulture.

Standard 9: Laboratory Investigation (0143.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0143.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0143.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0143.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0143.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0143.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0143.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in environmental technology.
- Locate, evaluate, and collect information from a variety of sources related to environmental technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0143.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0143.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to environmental technology.
0143.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of environmental technology.

Standard 11: Process/Workplace Skills (0143.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0143.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0143.11.2 Explore careers available in environmental technology.
0143.11.3 Use a variety of sources to investigate the educational requirements of various careers in environmental technology.
0143.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0143.11.5 Demonstrate correct language usage in all oral and written work.
0143.11.6 Perform effectively in both leadership and non-leadership roles.
0143.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0143.11.8 Participate as a team member to complete a variety of assignments.

Food Science and Processing

This course is designed to provide students with knowledge, skills and competencies needed to enter various food science and food products processing careers. Major concepts covered are leadership, nutrition, food safety, and food products processing and marketing of food products.

Standard 1: Leadership (0144.S.1)
Students will demonstrate leadership skills.

Leadership Objectives
Students will:
0144.1.1 List food science and food products processing related careers.
0144.1.2 Participate in FFA activities.
0144.1.3 Complete a Supervised Agricultural Experience (SAE) Program.
0144.1.4 Present individual and group presentations on food products processing related topics.
0144.1.5 Conduct meetings using parliamentary law.

Standard 2: Nutrition (0144.S.2)
Students will explain basics of good nutrition and good health.

Nutrition Objectives
Students will:
0144.2.1 Identify six basic nutrients and related nutrient deficiencies.
0144.2.2 Read and interpret information on product labels.
0144.2.3 Demonstrate knowledge of food groups by classifying foods accordingly.
0144.2.4 Explain procedures involved in enhancing the nutritional value of food.
0144.2.5 Relate retail cost and nutritional value of food palatability.
0144.2.6 Demonstrate an awareness of the effects of food on physical health and well being.

Standard 3: Food Safety (0144.S.3)
Students will describe factors affecting food safety.

Food Safety Objectives
Students will:
0144.3.1 Identify common risks and safety hazards involved in storage, handling, processing and preparation of food products.
0144.3.2 Understand the influence of potable water on processing, storing and packaging food.
0144.3.3 Describe the effects of microbes on food spoilage during processing, handling, storage and food preparation.
0144.3.4 Describe FSIS and USDA inspection and grading standards relating to food products.
0144.3.5 Relate the importance of product testing to providing a safe and wholesome food supply (including drugs/hormones, pesticides and consumer quality issues.)

Standard 4: Food Products Processing (0144.S.4)
Students will explore different techniques of processing foods.

Food Products Processing Objectives
Students will:
0144.4.1 Analyze the effects of food processing techniques on the nutritional value of foods.
0144.4.2 Demonstrate food-processing techniques used in the dairy products industry. (fermentation, pasteurization and homogenization).
0144.4.3 Describe techniques used in cereal grain processing. (bleaching, grinding, milling and enriching).

0144.4.4 List processing techniques used in the meat industry. (cooking, curing, grinding).
0144.4.5 Demonstrate an awareness of food processing techniques used in the fruit and vegetable industry (canning, freezing, heating.)
0144.4.6 Dehydrate food items to produce less perishable products.
0144.4.7 Describe and demonstrate food preservation techniques.
0144.4.8 Identify bioengineered food items and describe microbiological processing techniques.

Standard 5: Marketing (0144.S.5)
Students will explore factors that influence food cost and consumption trends.

Marketing Objectives
Students will:
0144.5.1 Describe the relative cost of food in the U.S. as compared to other counties.
0144.5.2 Identify trends and cycles in food product markets.
0144.5.3 Relate pricing of products to trends and cycles in markets.
0144.5.4 Demonstrate an awareness of different packaging techniques and their effects on product quality.
0144.5.5 List transportation methods used in marketing products.

Standard 6: Technology Applications (0144.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0144.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in food science and processing.
- Locate, evaluate, and collect information from a variety of sources related to food science and processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0144.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0144.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to food science and processing.
0144.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of food science and processing.

Standard 7: Process/Workplace Skills (0144.S.7)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0144.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0144.7.2 Explore careers available in food science and processing.
0144.7.3 Use a variety of sources to investigate the educational requirements of various careers in food science.
0144.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0144.7.5 Demonstrate correct language usage in all oral and written work.
0144.7.6 Perform effectively in both leadership and non-leadership roles.
0144.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0144.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0144.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0144.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0144.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0144.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0144.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Hydroponics

This course emphasizes the scientific method in the production of hydroponic plants. The curriculum provides problem solving experiences and skills in plant propagation, plant growth and development in a soilless media.

Standard 1: Orientation to Hydroponics and Industry (0145.S.1)
Students will explore hydroponics technique and identify the progress in the industry.

Hydroponics and Industry Objectives
Students will:
0145.1.1 Describe the history and development of hydroponic growing techniques.
0145.1.2 Identify advantages and constraints of hydroponics.
0145.1.3 Compare and contrast traditional growing methods to soilless culture.

Standard 2: Classification of Hydroponic Plant Production System (0145.S.2)
Students will recognize the diversity of hydroponic systems and media.

Classification Objectives
Students will:
0145.2.1 Describe the difference between open and closed plant production system.
0145.2.2 Identify types and characteristics of soilless media.
0145.2.3 Describe solution, culture methods and nutrient film technique.

Standard 3: Plant Growth and Development (0145.S.3)
Students will describe plant structures and environmental requirements for plant growth.

Plant Growth and Development Objectives
Students will:
0145.3.1 Identify plant structures and functions.
0145.3.2 Describe environmental requirements for plant growth.

Standard 4: Leadership and Interpersonal Skill Development (0145.S.4)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0145.4.1 Serve as a small group team leader.
0145.4.2 Identify leadership and decision making skills.
0145.4.3 Participate in committee and leadership development activities.
0145.4.4 Conduct community and school improvement projects.

Standard 5: Developing Work-Based Experiential Programs (0145.S.5)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0145.5.1 Determine areas and careers of major interest in agriculture.
0145.5.2 Manage school-based hydroponics laboratory enterprises.
0145.5.3 Establish experience program record book procedures.

Standard 6: Laboratory Safety Skills (0145.S.6)
Students will practice and demonstrate safety in the laboratory.

Safety Skills Objectives
Students will:
0145.6.1 Establish a safe working environment.
0145.6.2 Identify safety polices and procedures.
0145.6.3 Demonstrate proper use of equipment.

Standard 7: Computer Applications in Hydroponics and Plant Science (0145.S.7)
Students will apply technology to investigate real-world problems.

Computer Applications Objectives
Students will:
0145.7.1 Use Internet for research applications in hydroponics.
0145.7.2 Identify how computer based systems may be used for hydroponics environmental control.
0145.7.3 Utilize keyboarding and word processing skills to prepare class reports.

Standard 8: Greenhouse Structures (0145.S.8)
Students will recognize environmental components for structure construction and operation.

Greenhouse Structures Objectives
Students will:
0145.8.1 Identify environmental controls (heating and cooling components) of a greenhouse.
0145.8.2 Explain the function of greenhouse structure components.
0145.8.3 Determine the appropriate site and location of a hydroponics greenhouse.

Standard 9: Producing Hydroponic Crops (0145.S.9)
Students will determine appropriate amendments and identify effective procedures for hydroponic crop management.

Hydroponic Crops Objectives
Students will:
0145.9.1 List requirements of hydroponic tomatoes and lettuce production systems.
0145.9.2 Identify other plants that may be produced hydroponically.
0145.9.3 Test, interpret and manage pH.
0145.9.4 Measure electrical conduction of nutrient solution.
0145.9.5 Mix and manage hydroponic solutions.
0145.9.6 Determine methods of biological insect control.
0145.9.7 Identify mineral deficiencies.

Leadership Development

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships.

Standard 1: Leadership Styles (0146.S.1)
Students will describe various leadership styles.

Leadership Styles Objectives
Students will:
0146.1.1 Define leadership.
0146.1.2 Explain traits and styles.
0146.1.3 Explore different personality traits.
0146.1.4 Recognize informal leader.

Standard 2: Developing Formal Leadership Methods (0146.S.2)
Students will explain leadership methods.

Formal Leadership Objectives
Students will:
0146.2.1 Describe duties of officers in an organization.
0146.2.2 Define all different forms of motions.
0146.2.3 Identify proper conduct for meetings.

Standard 3: Public Speaking (0146.S.3)
Students will acquire skills in public speaking.

Public Speaking Objectives
Students will:
0146.3.1 Present two required speeches.
0146.3.2 Prepare an introduction for invited guest speakers.
0146.3.3 Observe invited quest speakers for different speaking styles.
0146.3.4 Become involved in a controlled debate.
0146.3.5 Conduct small group discussions on current events.

Standard 4: Community Service (0146.S.4)
Students will develop skills to participate in community service.

Community Service Objectives
Students will:
0146.4.1 Conduct community projects. Depending on the community the class can do many different projects with the Chamber of Commerce, Rotary, United Way, etc.
0146.4.2 Conduct school improvement projects. Work with the student council in developing projects that will improve the school grounds, buildings, etc.
0146.4.3 Conduct projects that deal with drug awareness, drinking and driving, etc.

Standard 5: Goal Setting (0146.S.5)
Students will use goal setting, time management and stress management.

Goal Setting Objectives
Students will:
0146.5.1 Explore goal setting (long term and short term).

0146.5.2 Describe methods of time management.
0146.5.3 Identify stress reduction methods.

Standard 6: Job Seeking Skills (0146.S.6)
Students will develop job-seeking skills.

Job Seeking Skills Objectives
Students will:
0146.6.1 Explore areas of proper dress in the work place.
0146.6.2 Prepare a cover letter and resume.
0146.6.3 Describe proper interview techniques for an oral interview.

Standard 7: Interpersonal Relations (0146.S.7)
Students will demonstrate interpersonal relationships for job success.

Interpersonal Relations Objectives
Students will:
0146.7.1 Explain and discuss a paradigm shift.
0146.7.2 Write thank you letters to the teachers before graduation.
0146.7.3 Explore conflict resolution.
0146.7.4 Hold mock social gathering with adults.
0146.7.5 Explore proper ethics and values.

Standard 8: Technology Application (0146.S.8)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0146.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in leadership development.
- Locate, evaluate, and collect information from a variety of sources related to leadership development.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0146.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0146.8.3 Use TV/Satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to leadership development.
0146.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of leadership development.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Leadership Development (0147.S.1)
Students will participate in activities to promote leadership development.

Leadership Development Objectives
Students will:
0147.1.1 Identify the year FFA was formed.
0147.1.2 Name the author of the creed.
0147.1.3 Identify the location of the state and national convention.
0147.1.4 Name the state and national FFA advisors.
0147.1.5 Name the degree levels in FFA.
0147.1.6 Identify parts of the emblem.
0147.1.7 Present a speech on outdoor recreation.

Standard 2: Career Development (0147.S.2)
Students will research career development in outdoor recreation.

Career Development Objectives
Students will:
0147.2.1 Identify regional career opportunities in outdoor recreation including. Park Ranger, Recreation Manager, Instructor, Conservation Officer, First Aid/Safety Expert, Entertainment Manager, Business Manager, Outdoor Guide, Youth Camp Operator, Campground Owner, Riding Stable Owner and Lifeguard.
0147.2.2 Profile outdoor recreation specialists.
0147.2.3 Develop teamwork skills and activities.
0147.2.4 Develop public relation skills.

Standard 3: Outdoor Safety (0147.S.3)
Students will participate in activities to promote outdoor safety.

Outdoor Safety Objectives
Students will:
0147.3.1 Obtain Red Cross first aid certificate.
0147.3.2 Obtain Red Cross adult CPR certificate.
0147.3.3 Identify potential outdoor safety hazards.
0147.3.4 Identify poisonous plants.
0147.3.5 Identify poisonous insects.
0147.3.6 Identify poisonous animals.
0147.3.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 4: Natural Resource and Recreation (0147.S.4)
Students will identify natural resource and recreation areas.

Natural Resource and Recreation Objectives
Students will:
0147.4.1 Describe geological formations.
0147.4.2 Recognize services required for recreational areas.
0147.4.3 Recognize facilities required for recreational areas.

0147.4.4 Identify endangered species of plants and animals.
0147.4.5 Identify wetlands and riparian zones.
0147.4.6 Describe local, state and federal laws related to recreational enterprises.

Standard 5: Business Opportunities and Promotions (0147.S.5)
Students will recognize business opportunities and promotions.

Business Opportunities and Promotions Objectives
Students will:
0147.5.1 Recognize income potential from various types of recreational enterprises.
0147.5.2 Identify business procedures required of recreational enterprises.
0147.5.3 Design advertising media to promote a recreational area effectively.

Standard 6: Laboratory Investigation (0147.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0147.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0147.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0147.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0147.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Application (0147.S.7)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0147.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in outdoor recreation.
- Locate, evaluate, and collect information from a variety of sources related to outdoor recreation.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0147.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0147.7.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 8: Process/Work Place Skills (0147.S.8)
Students will demonstrate personal and group workplace skills.

Process/Work Place Skills Objectives
Students will:
0147.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0147.8.2 Explore careers available in outdoor recreation.
0147.8.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
0147.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0147.8.5 Demonstrate correct language usage in all oral and written work.
0147.8.6 Perform effectively in both leadership and non-leadership roles.
0147.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0147.8.8 Participate as a team member to complete a variety of assignments.

Poultry Science and Production

This agricultural science course is designed to give students a working knowledge of the poultry industry, which includes chickens, turkeys and other avian species. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection and economic and marketing principles related to employment. Students will develop a working knowledge of land use and poultry production to maintain an economical level of production. Upon completion course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Orientation to the Poultry Industry (0148.S.1)
Students will explore different facets of the poultry industry.

Poultry Industry Objectives
Students will:
0148.1.1 Describe the importance of the poultry industry to the state and national economy.
0148.1.2 Identify different types of poultry enterprises.
0148.1.3 Relate consumption trends in poultry products.
0148.1.4 Identify and analyze career opportunities in the poultry industry.

Standard 2: Selection for Production (0148.S.2)
Students will use industry standards for poultry selection.

Selection for Production Objectives
Students will:
0148.2.1 List the classes of poultry and identify common breeds.
0148.2.2 Describe characteristics of birds that relate to productivity.
0148.2.3 Explain criteria to consider in selecting a breed for various types of production.
0148.2.4 Describe factors that influence chick purchase decisions.
0148.2.5 Describe characteristics associated with high egg production and procedures used in culling.
0148.2.6 Describe selection characteristics of parent and grandparent seed stock lines.

Standard 3: Nutrition and Management (0148.S.3)
Students will study factors that affect profitability.

Nutrition and Management Objectives
Students will:
0148.3.1 Describe factors that affect cost of poultry and egg production.
0148.3.2 Determine facility and equipment requirements for various poultry enterprises.
0148.3.3 Formulate rations for laying flocks, turkeys and broilers.
0148.3.4 Describe methods of disease and parasite control.
0148.3.5 Explain environmentally friendly methods of litter and dead bird disposal.
0148.3.6 Use computer programs to maintain inventory, expenses, income and other pertinent records.

Standard 4: Poultry Health and Management (0148.S.4)
Students will recognize best management practices for flock health.

Poultry Health and Management Objectives
Students will:
0148.4.1 Determine the type of care and housing facilities needed for poultry.
0148.4.2 Identify mechanical injury and treatment requirements.
0148.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0148.4.4 Utilize techniques in administration of medicine and immunization.

0148.4.5 Design and utilize a flock health program in poultry production.

Standard 5: Anatomy and Physiology (0148.S.5)
Students will utilize the fundamentals of anatomy and physiology in the production of poultry.

Anatomy and Physiology Objectives
Students will:
0148.5.1 Identify the major parts and functions of the anatomy of various types of poultry.
0148.5.2 Identify the major parts and functions of the digestive system.
0148.5.3 Identify the major parts and functions of the reproductive system.
0148.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to poultry management.
0148.5.5 Identify and explain modern poultry breeding techniques.
0148.5.6 Analyze and explain data utilizing genotypic information to form a superior poultry program.

Standard 6: Solid Waste (0148.S.6)
Students will explore strategies for handling poultry waste.

Solid Waste Objectives
Students will:
0148.6.1 Describe sources of solid waste associated with poultry industries.
0148.6.2 Explain hazards in solid waste materials and disposal.
0148.6.3 Describe ways of disposing of solid waste.
0148.6.4 Identify NRCS and SCS programs available for assistance in litter disposal.
0148.6.5 Explain recycling.
0148.6.6 Describe composting.
0148.6.7 Identify methods and benefits of composting.

Standard 7: Marketing (0148.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:
0148.7.1 Research and study various livestock marketing techniques.
0148.7.2 Identify transportation and safety methods for livestock handling.
0148.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0148.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Leadership and Communication (0148.S.8)
Students will demonstrate leadership in the poultry industry.

Leadership and Communication Objectives
Students will:
0148.8.1 Present written and oral reasons in poultry judging events.
0148.8.2 Participate in FFA meetings and activities.
0148.8.3 Prepare and present speeches on issues involving the poultry industry using information available from magazines, trade journals, the Internet and other sources.

Standard 9: Technology Applications (0148.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0148.9.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in poultry production.
- Locate, evaluate, and collect information from a variety of sources related to poultry production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0148.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0148.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to poultry production.

0148.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of poultry production.

Standard 10: Process/Workplace Skills in Agribusiness (0148.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:

0148.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0148.10.2 Explore careers available in agribusiness.

0148.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.

0148.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0148.10.5 Demonstrate correct language usage in all oral and written work.

0148.10.6 Perform effectively in both leadership and non-leadership roles.

0148.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0148.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Lab Investigation (0148.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Lab Investigation Objectives
Students will:

0148.11.1 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0148.11.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0148.11.3 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

0148.11.4 Conduct a supervised agricultural experience program with appropriate records.

Small Animal Care and Management

This course is designed to give students a working knowledge of the small animal care industry, which includes dogs, cats, birds, reptiles and other pets. The course provides an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of small animals, their management and a keen business sense relating to small animals. Upon completion of this course, students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0149.S.1)
Students will demonstrate leadership skills for success in the small animal industry.

Leadership Objectives
Students will:
0149.1.1 Identify FFA and it's components.
0149.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0149.1.3 Identify appropriate career opportunities in the small animal care industry.
0149.1.4 Draft a resume, fill out a job application, and demonstrate job seek/keep skills.
0149.1.5 Develop personal relation and communication skills.
0149.1.6 Identify animal welfare ethics and other issues.
0149.1.7 Develop a working relationship with local veterinarians.

Standard 2: History and Selection of Animals (0149.S.2)
Students will provide background information and describe the desirable characteristics of domestic animals.

Animals Objectives
Students will:
0149.2.1 Relate the history of domestic animals to modern animal production.
0149.2.2 Describe and classify small animals according to purposes/uses.
0149.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0149.2.4 Relate the characteristics of breeds to methods of selection.
0149.2.5 Be able to differentiate between domestic and exotic animals.

Standard 3: Training, Handling and Restraint (0149.S.3)
Students will demonstrate safe handling and restraining techniques.

Training, Handling and Restraint Objectives
Students will:
0149.3.1 Identify and use tools related to training and handling/restraint of small animals.
0149.3.2 Identify methods and techniques used in restraint and training of small animals.
0149.3.3 Utilize basic commands and training methods.
0149.3.4 Identify AKC guidelines for instructing dogs.
0149.3.5 Utilize safety practices in training and handling.

Standard 4: Grooming and Clipping (0149.S.4)
Students will demonstrate skills in grooming and clipping.

Grooming and Clipping Objectives
Students will:
0149.4.1 Utilize safety practices in grooming and clipping small animals.
0149.4.2 Identify tools used in grooming.
0149.4.3 Describe grooming practices (bathing, clipping, nail trimming, combing/brushing).
0149.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0149.S.5)
Students will utilize the fundamentals of anatomy and physiology in caring for small animals.

Anatomy and Physiology Objectives
Students will:
0149.5.1 Identify the major parts and functions of the skeletal system.
0149.5.2 Identify the major parts and functions of the muscular system.
0149.5.3 Identify the major parts and functions of the nervous system.
0149.5.4 Identify the major parts and functions of the endocrine system.
0149.5.5 Identify the major parts and functions of the respiratory system.
0149.5.6 Identify the major parts and functions of the circulatory system.
0149.5.7 Identify the major parts and functions of the reproductive system.
0149.5.8 Identify the major parts and functions of the excretory system.
0149.5.9 Identify the major parts and functions of the digestive system.
0149.5.10 Explain the difference between ruminant and monogastric systems.
0149.5.11 Describe functions of other small animals systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0149.S.6)
Students will demonstrate competencies in animal health and management.

Animal Health and Management Objectives
Students will:
0149.6.1 Determine the type of care and housing facilities needed.
0149.6.2 Identify mechanical injury and basic first aid requirements.
0149.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0149.6.4 Utilize techniques in administering medicine and immunizing.

Standard 7: Nutrition (0149.S.7)
Students will describe the role of nutrition in small animal care.

Nutrition Objectives
Students will:
0149.7.1 Define terms associated with nutrition.
0149.7.2 List and describe the basic nutrients and their functions.
0149.7.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0149.7.4 Identify signs of nutritional deficiencies.
0149.7.5 Identify feeding and care requirements throughout life cycle and pregnancy.

Standard 8: Marketing (0149.S.8)
Students will demonstrate competencies in marketing small animals.

Marketing Objectives
Students will:
0149.8.1 Explore types of markets available.

0149.8.2 Identify transportation methods.
0149.8.3 Research types of laws, regulations and licenses needed in local area.
0149.8.4 Analyze costs of owning and operating a small animal care business.

Standard 9: Technology Applications (0149.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0149.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0149.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0149.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0149.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 10: Process/Workplace Skills in Agribusiness (0149.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:
0149.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0149.10.2 Explore careers available in agribusiness.
0149.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0149.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0149.10.5 Demonstrate correct language usage in all oral and written work.
0149.10.6 Perform effectively in both leadership and non-leadership roles.
0149.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0149.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Laboratory Investigation (0149.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0149.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0149.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0149.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0149.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Soil And Plant Science (Agronomy)

This area of study is designed to provide students with scientific knowledge and experiences essential to careers in soil and plant science. The course includes major units in soil formation, soil properties, land classification, fertility, plant growth and the impact of agriculture on the environment.

Standard 1: Orientation to Soil and Plant Science (0150.S.1)
Students will soil and plant science.

Soil and Plant Science Objectives
Students will:
0150.1.1 Research career opportunities in soil and plant science.
0150.1.2 Describe the impact of agriculture on the environment.
0150.1.3 List and describe the function of federal, state and local entities and interest groups concerned with soil and plant science.
0150.1.4 Examine the role of soil and plants in the ecosystem.

Standard 2: Leadership Development (0150.S.2)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0150.2.1 Participate in meetings using parliamentary law.
0150.2.2 Use interpersonal skills in team problem solving.
0150.2.3 Prepare and deliver a brief presentation on an agronomic topic.

Standard 3: Provide Work-Based Experiential Learning Opportunities (0150.S.3)
Students will participate in a work-base experience program.

Work-Based Objectives
Students will:
0150.3.1 Explore opportunities for work-based experience through supervised experience programs.
0150.3.2 Define record keeping terms for supervised experience programs.
0150.3.3 Develop budgets for potential supervised experience programs.

Standard 4: Soil Origin and Development (0150.S.4)
Students will identify how soil is formed and surveyed.

Soil Origin and Development Objectives
Students will:
0150.4.1 Determine how soil is formed.
0150.4.1 Interpret information from soil surveys.

Standard 5: Physical Properties of Soil (0150.S.5)
Students will identify the various physical properties of soil samples.

Soil Objectives
Students will:
0150.5.1 Define and determine soil depth.
0150.5.2 Define and determine soil texture.
0150.5.3 Define and determine soil structure.
0150.5.4 Define and determine soil permeability.

0150.5.5 Define and determine drainage.
0150.5.6 Define and determine slope.

Standard 6: Classification of Soils Into Soil Series and Land Capability Classes (0150.S.6)
Students will identify the various classification of soil.

Classification of Soils Objectives
Students will:
0150.6.1 Classify soils by common physical properties.
0150.6.2 Describe soil series of the region.
0150.6.3 Determine land capability classes and recommend appropriate land management practices.

Standard 7: Plant Nutrition and Soil Fertility (0150.S.7)
Students will identify the various functions of plant nutrition and soil fertility.

Plant Nutrition and Soil Fertility Objectives
Students will:
0150.7.1 List and describe the functions of macro and micronutrients.
0150.7.2 Describe and identify plant nutrient deficiencies.
0150.7.3 Explain the function and management of soil pH.
0150.7.4 Describe and engage in the process of soil testing.
0150.7.5 Interpret and apply data generated by soil testing.
0150.7.6 List and compare sources of plant nutrients.
0150.7.7 Identify nutrient deficiencies and plant diseases.
0150.7.8 Conduct plant growth experiments.
0150.7.9 Use soil-testing equipment.

Standard 8: Plant Structures and their Functions (0150.S.8)
Students will identify the various plant structures and their functions.

Plant Structures Objectives
Students will:
0150.8.1 Explain basic plant production requirements.
0150.8.2 Identify the major parts of a plant.
0150.8.3 Describe the function of the major parts of a plant.
0150.8.4 Demonstrate knowledge of plant growth processes photosynthesis, respiration and transpiration.

Standard 9: Row Crop Management (0150.S.9)
Students will identify the various methods to row crop management.

Row Crop Management Objectives
Students will:
0150.9.1 Identify row crops common to the area.
0150.9.2 Describe cultural requirements and production practices of row crops.
0150.9.3 List and describe harvesting methods.

Standard 10: Forage Management (0150.S.10)
Students will identify the various methods to row crop management.

Forest Management Objectives
Students will:
0150.10.1 Identify forage crops common to the area.
0150.10.2 Describe cultural requirements and production practices of forage crops.
0150.10.3 List and describe harvesting methods.

Standard 11: Soil and Water Conservation (0150.S.11)
Students will identify the various methods of soil and water conservation.

Soil and Water Conservation Objectives
Students will:
0150.11.1 Define and provide examples of erosion.
0150.11.2 Explain agricultural practices to conserve soil and reduce pollution (stewardship).
0150.11.3 Predict impacts of erosion.
0150.11.4 Identify and describe best management practices to prevent soil erosion.
0150.11.5 Utilize the World Wide Web to explore specialty areas in soil and plant science.

Standard 12: Laboratory Investigation (0150.S.12)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0150.12.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0150.12.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0150.12.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0150.12.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 13: Technology Applications (0150.S.13)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0150.13.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in soil and plant science.
- Locate, evaluate, and collect information from a variety of sources related to soil and plat science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0150.13.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0150.13.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to soil and plant science.
0150.13.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of soil and plant science.

Standard 14: Process/Workplace Skills (0150.S.14)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0150.14.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0150.14.2 Explore careers available in soil and plant science.
0150.14.3 Use a variety of sources to investigate the educational requirements of various careers in soil and plant science.
0150.14.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0150.14.5 Demonstrate correct language usage in all oral and written work.
0150.14.6 Perform effectively in both leadership and non-leadership roles.
0150.14.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0150.14.8 Participate as a team member to complete a variety of assignments.

Forestry 1

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Leadership Develop (0182.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Develop Objectives
Students will:
0182.1.1 Identify the year FFA was formed.
0182.1.2 Name the author of the creed.
0182.1.3 Identify the location of the state and national convention.
0182.1.4 Name the state and national FFA advisor.
0182.1.5 Name the degree levels in FFA.
0182.1.6 Identify parts of the emblem.

Standard 2: Safety Principles in Forestry (0182.S.2)
Students will identify and utilize appropriate safety equipment and regulations.

Safety Principles in Forestry Objectives
Students will:
0182.2.1 Wear appropriate safety gear.
0182.2.2 Maintain a safe working environment.
0182.2.3 Identify safety hazards of fire line construction and mop-up.

Standard 3: Identify Economic Trees in West Virginia (0182.S.3)
Students will demonstrate the skill of tree identification with various methods.

Economic Trees in West Virginia Objectives
Students will:
0182.2.1 Identify the following trees:
- Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine

0182.2.2 Identify by leaves.
0182.2.3 Identify by bark.
0182.2.4 Identify by taste and smell.
0182.2.5 Identify by twigs.
0182.2.6 Identify by fruit.
0182.2.7 Understand tree morphology.

Standard 4: Forest Fire Fighting Procedures (0182.S.4)
Students will demonstrate correct methods and use of proper equipment to control forest fires.

Forest Fire Objectives
Students will:
0182.4.1 Construct fire line using hand tools.
0182.4.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
0182.4.3 Extinguish remaining fire spots after main fire is contained (mop-up).
0182.4.4 Determine direction for fire line construction.
0182.4.5 Repair and service equipment after fire is extinguished.

0182.4.6 Use backpack pump to fight fire directly.

Standard 5: Forest Measurement Techniques (0182.S.5)
Students will identify and demonstrate forest measurement techniques.

Forest Measurement Techniques Objectives
Students will:
0182.5.1 Set up instrument for surveying.
0182.5.2 Use compass to maintain direction.
0182.5.3 Make linear measurements using surveyor's chain with compass.
0182.5.4 Make linear measurements by pacing with compass.
0182.5.5 Calculate the number of acres in a timber tract.
0182.5.6 Use hand/staff compass to determine bearing or Azimuth.
0182.5.7 Identify units of measurement (mile, rod, chain and acre).

Standard 6: Silviculture Treatment for Timber Stand Improvement (0182.S.6)
Students will identify silvicultural procedures.

Silviculture Treatment Objectives
Students will:
0182.6.1 Determine major forest type and primary uses.
0182.6.2 Determine proper spacing using D+6 rule.
0182.6.3 Use increment borer to determine age and growth rate.
0182.6.4 Select and utilize pruning and thinning methods for a timber stand.
0182.6.5 Fell and limb trees.

Standard 7: Laboratory Investigations/Hands-On Learning (0182.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0182.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0182.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0182.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0182.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Chainsaw Safety (0183.S.1)
Students will demonstrate proper safety techniques for chainsaw usage.

Chainsaw Safety Objectives
Students will:
0183.1.1 Identify and use safety clothing and equipment.
0183.1.2 Use proper starting techniques.
0183.1.3 Identify proper safety rules with 100% accuracy.
0183.1.4 Identify and correct hazardous operational conditions.

Standard 2: Chainsaw Maintenance (0183.S.2)
Students will demonstrate proper chainsaw maintenance.

Chainsaw Maintenance Objectives
Students will:
0183.2.1 Properly sharpen chain.
0183.2.2 Determine and adjust chain for proper tension.
0183.2.3 Demonstrate proper cleaning and storage of chainsaw.
0183.2.4 Replace sprocket on chainsaw.
0183.2.5 Replace bar on chainsaw.
0183.2.6 Replace broken chain link.
0183.2.7 Clean and service carburetor and air cleaner.
0183.2.8 Replace chain clutch as needed.
0183.2.9 Adjust carburetor for maximum efficiency.
0183.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber (0183.S.3)
Students will correctly calculate the volume of standing timber using various tools and scales.

Volume of Standing Timber Objectives
Students will:
0183.3.1 Define and calculate board foot and cord wood volumes.
0183.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
0183.3.3 Determine number of logs per tree using tree stick or clinometers.
0183.3.4 Record volume number of individual trees using tally sheet method.
0183.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0183.3.6 Calculate volume of pulpwood by cords.

Standard 4: Wildlife Habitat Management (0183.S.4)
Students will demonstrate proper techniques to develop wild life habitat through forestry practices.

Wildlife Habitat Management Objectives
Students will:
0183.4.1 Monitor and improve water quality.
0183.4.2 Improve habitat for bird, fish and game.
0183.4.3 Understand the importance of the forest, field and edge.
0183.4.4 Identify potential den and mast trees.

Standard 5: Laboratory Investigations – Hands-On Learning (0183.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:

0183.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0183.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0183.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0183.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Technology Applications in Forestry (0183.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0183.6.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0183.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0183.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

0183.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Personal Leadership Skills Development (0184.S.1)
Students will conduct research in the forest industry and make presentations.

Personal Leadership Skills Development Objectives
Student will:
0184.1.1 Describe the parts of a good speech.
0184.1.2 Explain how to present a desirable speech.
0184.1.3 Correctly conduct research in topics concerning forestry.
0184.1.4 Deliver a speech on a forestry topic.

Standard 2: Advanced Dendrology Skills (0184.S.2)
Students will demonstrate advanced skills in tree identification.

Advanced Dendrology Skills Objectives
Students will:
0184.2.1 Identify by flowers.
0184.2.2 Identify by growth characteristics.
0184.2.3 Identify by site conditions.
0184.2.4 Identify by distribution.

Standard 3: Safety Training in Forestry (0184.S.3)
Students will demonstrate safety practices with equipment used in forestry.

Safety Training Objectives
Students will:
0184.3.1 Demonstrate safety with hand tools.
0184.3.2 Demonstrate safety with chainsaws.
0184.3.3 Demonstrate safety with tractors.
0184.3.4 Demonstrate safety on the fire line.

Standard 4: Operation and Maintenance of Forestry Equipment (0184.S.4)
Students will demonstrate operation and maintenance of equipment used in forestry.

Forestry Equipment Objectives
Students will:
0184.4.1 Demonstrate the proper use and maintenance of hand tools.
0184.4.2 Demonstrate the proper use and maintenance of chainsaws.
0184.4.3 Demonstrate the proper use and maintenance of tractors.
0184.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Silvicultural Applications for Timber Stands (0184.S.5)
Students will apply silviculture practices in timber stands.

Timber Stands Objectives
Students will:
0184.5.1 Demonstrate forest reproduction techniques.

0184.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
0184.5.3 Define clear-cut.

Standard 6: Laboratory Investigations/Hands-on Learning (0184.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0184.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0184.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0184.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0184.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0184.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0184.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0184.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0184.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0184.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Parliamentary Procedure (0185.S.1)
Students will demonstrate parliamentary procedure.

Parliamentary Procedure Objectives
Students will:
0185.1.1 Identify proper procedures for conducting a meeting.
0185.1.2 Write and present a committee report.
0185.1.3 Identify components of a program of activities.

Standard 2: Safety Procedures in Fire Line Construction (0185.S.2)
Students will demonstrate procedures to safely construct a fire line.

Fire Line Construction Objectives
Students will:
0185.2.1 Explain fire line safety.
0185.2.2 Explain fire line construction.
0185.2.3 Explain forest fire mop-up.
0185.2.4 Explain the use of topographic maps in locating access roads and trails.
0185.2.5 Explain the use of topographic maps in fire location.
0185.2.6 Repair, service and store equipment.

Standard 3: Use of Forest Surveying Equipment (0185.S.3)
Students will utilize equipment necessary to survey a forest.

Forest Surveying Equipment Objectives
Students will:
0185.3.1 Interpret surface features using aerial photography and topographic maps.
0185.3.2 Conduct a boundary survey using a hand compass and pacing.
0185.3.3 Visit a courthouse and conduct a title search.
0185.3.4 Plot bearings from deeds.
0185.3.5 Calculate percent slope using a clinometer.
0185.3.6 Orientate topographic map using hand compass.
0185.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Utilization of Best Management Practices (0185.S.4)
Students will describe the best management practices in forest road construction.

Best Management Practices Objectives
Students will:
0185.4.1 Lay out roads in compliance with West Virginia forest standards.
0185.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0185.4.3 Describe the process of installing culverts, water breaks and "woods" bridges.
0185.4.4 Design skid roads.
0185.4.5 Monitor water quality.
0185.4.6 Reseed skid trails and log landings.

Standard 5: Wood Products Utilization (0185.S.5)
Students will process, measure and market forest products.

Wood Products Utilization Objectives
Students will:
0185.5.1 Demonstrate competency in felling, bucking and skidding selected trees.
0185.5.2 Scale logs and lumber.
0185.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Laboratory Investigations – Hands-On Learning (0185.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0185.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0185.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0185.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0185.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0185.S.7)
Students will apply technology to investigate real-world problems.

Forestry Objectives
Students will:
0185.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0185.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0185.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0185.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Forestry Equipment: Identification and Use (0186.S.1)
Students will demonstrate safe use of forestry equipment.

Forestry Equipment Objectives
Students will:
0186.1.1 Identify and use the following:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

Standard 2: Conduct a Timber Cruise (0186.S.2)
Students will demonstrate skills needed to conduct a timber cruise using various equipment.

Timber Cruise Objectives
Students will:
0186.2.1 Mark boundaries and corners of tract.
0186.2.2 Use compass to direct cruising operation.
0186.2.3 Measure distance between plot center (by pacing).
0186.2.4 Record trees using tally sheet method.
0186.2.5 Use wedge prism (BAF 10 or BAF 20).
0186.2.6 Calculate board foot volumes using double log scale.

Standard 3: Application of Best Management Practices (0186.S.3)
Students will apply best management practices in a forestry setting.

Application of Best Management Practices Objectives
Students will:
0186.3.1 Lay out roads in compliance with West Virginia forest standards.
0186.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0186.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
0186.3.4 Design skid roads.
0186.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
0186.3.6 Scale logs and lumber.
0186.3.7 Monitor water quality.
0186.3.8 Reseed skid trails and log landings.

Standard 4: Laboratory Investigations – Hands-On Learning (0186.S.4)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0186.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0186.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0186.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0186.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Technology Applications in Forestry (0186.S.5)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0186.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0186.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0186.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom a assignments related to forestry.

0186.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Process/Workplace Skills in Forestry (0186.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0186.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0186.6.2 Explore careers available in forestry.

0186.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

0186.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0186.6.5 Demonstrate correct language usage in all oral and written work.

0186.6.6 Perform effectively in both leadership and non-leadership roles.

0186.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0186.6.8 Participate as a team member to complete a variety of assignments.

Forestry Science And Ecology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the forestry industry. Major instructional concepts include the scientific aspects of dendrology, silviculture, integrated wildlife management and ecology. Additionally, the student will study safety, surveying and measuring timber.

Standard 1: Leadership Development (0187.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Development Objectives
Students will:
0187.1.1 Identify the year FFA was formed.
0187.1.2 Name the author of the creed.
0187.1.3 Identify the location of the state and national convention.
0187.1.4 Name the state and national FFA advisor.
0187.1.5 Name the degree levels in FFA.
0187.1.6 Identify parts of the emblem.

Standard 2: Safety (0187.S.2)
Students will identify and utilize appropriate safety procedures associated with forestry.

Safety Objectives
Students will:
0187.2.1 Wear appropriate safety gear.
0187.2.2 Maintain a safe working environment.
0187.2.3 Identify and use safety clothing and equipment.
0187.2.4 Identify proper safety rules with 100% accuracy.
0187.2.5 Identify and correct hazardous operational conditions.

Standard 3: Fire Line Safety (0187.S.3)
Students will demonstrate appropriate safety practices involved in creating a fire line.

Fire Line Safety Objectives
Student will:
0187.3.1 Identify fire fighting tools.
0187.3.2 Explain fire line safety.
0187.3.3 Explain fire line construction.
0187.3.4 Explain forest fire mop-up.
0187.3.5 Explain the use of topographic maps in location access roads and trails.
0187.3.6 Explain the use of topographic maps in fire location.

Standard 4: Forestry Equipment (0187.S.4)
Students will identify equipment associated with forestry and explain their use.

Forestry Equipment Objectives
Students will:
0187.4.1 Identify by sight:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

0187.4.2 Explain the use of each tool.

Standard 5: Dendrology (0187.S.5)
Students will demonstrate appropriate tree identification techniques.

Dendrology Objectives
Students will:
0187.5.1 Identify by leaves.
0187.5.2 Identify by bark.
0187.5.3 Identify by twigs.
0187.5.4 Identify by fruit.

Standard 6: Measurements (0187.S.6)
Students will demonstrate various methods of measurements involving forestland and product measurements.

Measurements Objectives
Students will:
0187.6.1 Organize and set up instruments for surveying.
0187.6.2 Use compass to maintain direction.
0187.6.3 Make linear measurements using surveyor's chain with compass.
0187.6.4 Make linear measurements by pacing with compass.
0187.6.5 Calculate the number of acres in a timber tract.
0187.6.6 Use hand/staff compass to determine bearing or Azimuth.
0187.6.7 Identify units of measurement (mile, rod, chain and acre.)
0187.6.8 Define and calculate board foot and cord wood volumes.
0187.6.9 Measure standing trees at diameter breast height using tree stick and diameter tape.
0187.6.10 Determine number of logs per tree using tree stick or clinometer.
0187.6.11 Record volume number of individual trees using tally sheet method.
0187.6.12 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0187.6.13 Calculate volume of pulpwood by cords.
0187.6.14 Interpret surface features using aerial photography and topographic maps.
0187.6.15 Conduct a boundary survey using hand compass and pacing.
0187.6.16 Calculate percent slope using a clinometer.
0187.6.17 Orientate topographic map using hand compass.
0187.6.18 Mark boundaries and corners of tract.
0187.6.19 Use compass to direct cruising operation.
0187.6.20 Measure distance between plot center (by pacing).
0187.6.21 Record trees using tally sheet method.
0187.6.22 Use wedge prism (BAF 10 or BAF 20).
0187.6.23 Calculate board foot volumes using double log scale.

Standard 7: Silviculture (0187.S.7)
Students will utilize various silviculture practices.

Silviculture Objectives
Students will:
0187.7.1 Determine major forest type and primary uses.
0187.7.2 Determine proper spacing using D+6 rule.
0187.7.3 Use increment borer to determine age and growth rate.
0187.7.4 Recognize insect and disease damage and mark damaged area for salvage.
0187.7.5 Identify forest reproduction techniques.
0187.7.6 Demonstrate the technique of girdling in the process of removing undesirable trees.
0187.7.7 Define clear-cutting.

Standard 8: Wildlife (0187.S.8)
Students will demonstrate correct wildlife management skills.

Wildlife Objectives
Students will:
0187.8.1 Monitor and improve water quality.
0187.8.2 Improve habitat for bird, fish and game.
0187.8.3 Understand the importance of the forest, field and edge.
0187.8.4 Identify potential den and mast trees.

Standard 9: Best Management Practices (0187.S.9)
Students will demonstrate an awareness of best management practices used in forestry.

Best Management Practices Objectives
Students will:
0187.9.1 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0187.9.2 Understand the importance of installing culverts, water breaks and "woods" bridges.
0187.9.3 Design skid roads.
0187.9.4 Monitor water quality.

Natural Resource Management 1

This agricultural science course is designed to provide students with science concepts and skills in natural resource management that will be useful in various occupations in the field. Major emphasis will be on the scientific concepts involving air, water, aquatic life, wildlife management and recreation. Interaction of ecosystems and their relationship to human populations will be studied. This field of study will prepare students for entry-level occupations in the natural resources area.

Standard 1: Natural Resource and the Environment (0188.S.1)
Students will describe the relationship between natural resources and the environment.

Natural Resource and the Environment Objectives
Students will:
0188.1.1 Identify exhaustible and inexhaustible resources.
0188.1.2 Explain the importance of natural resources.
0188.1.3 Describe the interaction of people with the environment.

Standard 2: Air and Quality (0188.S.2)
Students will explain the importance of air and maintaining its quality.

Air and Quality Objectives
Students will:
0188.2.1 Identify air pollutants and their sources.
0188.2.2 Describe the effect of air pollution on humans, other living things and materials.
0188.2.3 Sample, monitor and analyze air quality for physical and chemical properties.
0188.2.4 Examine wind (air) as an alternative energy source.

Standard 3: Water Quality (0188.S.3)
Students will explain the importance of water and maintaining its quality.

Water Quality Objectives
Students will:
0188.3.1 Identify sources of water and water pollutants.
0188.3.2 Explain the effect of water pollution on the ecosystem.
0188.3.3 Describe the hydroponical cycle.
0188.3.4 Identify point and non-point source pollution.
0188.3.5 Describe wetlands, their use, importance and preservation.
0188.3.6 Identify uses of water in agriculture.
0188.3.7 Explain methods of managing wastewater.
0188.3.8 Determine composition of wastewater using water-testing equipment.
0188.3.9 Explain methods of protecting water sources.

Standard 4: Aquatic Life (0188.S.4)
Students will demonstrate aquatic life and natural resource management skills.

Aquatic Life Objectives
Students will:
0188.4.1 Identify game fish species and other aquatic wildlife.
0188.4.2 Explain water quality requirements for aquatic wildlife.
0188.4.3 Explain fishing laws and regulations.
0188.4.4 Describe fish hatchery techniques.
0188.4.5 Check for pond oxygen deficiency and prescribe remedial programs.
0188.4.6 Explain stratification and fish adaptability.

0188.4.7 Identify a management plan for a designated stream, lake or pond.

Standard 5: Wildlife (0188.S.5)
Students will demonstrate of wildlife management skills.

Wildlife Objectives
Students will:
0188.5.1 Identify and classify species of birds and wildlife animals.
0188.5.2 List governmental agencies concerned with wildlife conservation.
0188.5.3 Outline a plan for stimulating native and introduced game populations.
0188.5.4 Outline a plan for hatching game bird eggs.
0188.5.5 Identify common diseases of game birds and animals.
0188.5.6 Identify practices that can be used to protect wildlife.
0188.5.7 Evaluate wildlife food and cover crops.
0188.5.8 Estimate animal populations on given areas of land.

Standard 6: Outdoor Recreation (0188.S.6)
Students will demonstrate competencies in outdoor recreation management.

Outdoor Recreation Objectives
Students will:
0188.6.1 List demands by the public for different types of outdoor recreation experiences.
0188.6.2 Recognize types of natural resources recreational areas and the service and facilities required.
0188.6.3 Recognize the income potential from various types of recreational enterprises.
0188.6.4 Identify business procedures required of a recreational enterprise.
0188.6.5 Describe local, state and federal laws pertaining to given enterprises.
0188.6.6 Design advertising media to promote a recreation area effectively.

Standard 7: Leadership (0188.S.7)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0188.7.1 Participate in FFA meetings and activities.
0188.7.2 Utilize record keeping skills in work-based experience programs (SAE).

Standard 8: Laboratory Investigations (0188.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0188.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0188.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0188.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0188.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 9: Technology Applications (0188.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0188.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0188.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0188.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.

0188.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 10: Process/Workplace Skills (0188.S.10)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0188.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0188.10.2 Explore careers available in natural resource management.

0188.10.3 Use a variety of sources to investigate the educational requirements of various careers in natural resource management.

0188.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0188.10.5 Demonstrate correct language usage in all oral and written work.

0188.10.6 Perform effectively in both leadership and non-leadership roles.

0188.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0188.10.8 Participate as a team member to complete a variety of assignments.

Natural Resource Management II

This agricultural science course is designed to provide students with advanced science concepts and skills in natural resource management. Major emphasis will be on soil, forestry, and land use planning including solid waste and hazardous waste disposal and soil fertility. This field of study prepares students for entry-level occupations in the area of natural resources management.

Standard 1: Occupations in Natural Resources (0189.S.1)
Students will describe the occupations related to natural resources.

Occupations in Natural Resources Objectives
Students will:
0189.1.1 Identify occupations in natural resource management.
0189.1.2 Determine requirements for occupational entry in natural resource management fields.
0189.1.3 Identify typical activities performed by natural resource workers.

Standard 2: Soils (0189.S.2)
Students will explain soils and their role in natural resource management.

Soils Objectives
Students will:
0189.2.1 Identify factors that affect soil formation and describe the significance of each.
0189.2.2 Make "feel" tests of wet and dry soil samples and classify each as sandy, loamy or clayey.
0189.2.3 Determine percentage of sand, loam and clay in soil samples and classify according to texture.
0189.2.4 Classify samples of topsoil in one of the three color groups.
0189.2.5 Determine pH values of soil.
0189.2.6 Classify soils with respect to permeability.
0189.2.7 Determine moisture content of soil.
0189.2.8 Recognize causes of soil erosion.
0189.2.9 Categorize soils into their land use capability classes.
0189.2.10 Identify appropriate erosion control measures for soils.
0189.2.11 Read soil maps and interpret terms and symbols.
0189.2.12 Develop a conservation land use plan for a farm.

Standard 3: Soil Fertility (0189.S.3)
Students will perform competencies related to maintaining soil fertility.

Soil Fertility Objectives
Students will:
0189.3.1 Collect soil samples, complete data forms and submit to a laboratory for analysis.
0189.3.2 Test soil for acidity or alkalinity and prescribe remedial measures.
0189.3.3 Make plant tissue analyses.
0189.3.4 Explain analysis data on a fertilizer tag.
0189. 3.5 Identify macronutrients and their deficiency symptoms.

Standard 4: Forestry (0189.S.4)
Students will explain the role of forestry principles in natural resource management.

Forestry Objectives
Students will:
0189.4.1 Relate benefits of forest resources to land, human and economic requirements.
0189.4.2 Recognize and name forest products.
0189.4.3 Identify tree parts and their functions.

0189.4.4 Identify common tree species.
0189.4.5 Plant tree seedlings using approved practices.
0189.4.6 Identify common tree pests and diseases.
0189.4.7 Prescribe control measures for pests and diseases.
0189.4.8 Describe the effect of forest fires on the forest floor.
0189.4.9 Identify fire suppression tools and equipment and state their functions.

Standard 5: Land Use Planning (0189.S.5)
Students will describe the principles of land use planning.

Land Use Planning Objectives
Students will:
0189.5.1 Outline steps in the land use planning process.
0189.5.2 Assemble information pertinent to developing a comprehensive plan.
0189.5.3 Describe functions of comprehensive plans and zoning ordinances.
0189.5.4 Obtain distances by pacing and using steel tapes.
0189.5.5 Use appropriate equipment to conduct a basic survey.
0189.5.6 Give legal descriptions of selected plots of land.
0189.5.7 Run a traverse with the surveyor's staff compass.

Standard 6: Minerals (0189.S.6)
Students will explain the role of minerals in natural resource management.

Minerals Objectives
Students will:
0189.6.1 Identify and classify samples of rocks and minerals common to the state.
0189.6.2 Describe formation of coal in the earth's crust.
0189.6.3 List functions of common minerals.
0189.6.4 Describe procedures in locating, extracting and processing minerals.
0189.6.5 Describe the impact of mining on the environment.
0189.6.6 Identify methods of mineral conservation.
0189.6.7 Identify a plan for restoration of an area that has been disturbed by mineral extraction.

Standard 7: Solid Waste (0189.S.7)
Students will describe the concepts of solid waste management.

Solid Waste Objectives
Students will:
0189.7.1 Describe kinds and sources of solid waste.
0189.7.2 Explain hazards in solid waste materials and disposal.
0189.7.3 Describe methods of solid waste disposal.
0189.7.4 Explain recycling.
0189.7.5 Describe composting.
0189.7.6 Explore methods and benefits of composting.

Standard 8: Hazardous Waste (0189.S.8)
Students will describe the concepts of hazardous waste management.

Hazardous Waste Objectives
Students will:
0189.8.1 Explain hazardous waste.
0189.8.2 Describe ecotoxicology.
0189.8.3 Explain disposing of hazardous waste.
0189.8.4 Explain safety procedures and clean-up of spills.

Standard 9: Leadership (0189.S.9)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0189.9.1 Participate in FFA meetings and activities.

Standard 10: Supervised Agricultural Experience Program (SAE) (0189.S.10)
Students will conduct a supervised agricultural experience program.

SAE Objectives
Students will:
0189.10.1 Conduct an experience program in the natural resource management area.
0189.10.2 Maintain appropriate records on the experience program.

Standard 11: Laboratory Investigations (0189.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0189.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0189.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0189.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0189.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 12: Technology Applications (0189.S.12)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0189.12.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0189.12.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0189.12.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.
0189.12.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 13: Process/Workplace Skills (0189.S.13)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0189.13.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize,

analyze, and report data.

0189.13.2 Explore careers available in natural resource management.

0189.13.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.

0189.13.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0189.13.5 Demonstrate correct language usage in all oral and written work.

0189.13.6 Perform effectively in both leadership and non-leadership roles.

0189.13.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0189.13.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Leadership and Communication Development (0190.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0190.1.1 Identify FFA history.
0190.1.2 Demonstrate proper use of parliamentary procedure.
0190.1.3 Participate in FFA activities.
0190.1.4 Prepare and deliver a brief presentation on a wildlife or natural resource topic.

Standard 2: History of Wildlife Management (0190.S.2)
Students will describe the importance of wildlife management and its impact on conservation.

History of Wildlife Management Objectives
Students will:
0190.2.1 Define and describe wildlife trends and their impact on management.
0190.2.2 Identify wildlife legalities and ethics.
0190.2.3 Define natural resources conservation.

Standard 3: Concepts of Wildlife Management (0190.S.3)
Students will describe the relationships between wildlife, humans and the ecosystem.

Concepts of Wildlife Management Objectives
0190.3.1 Define succession stages related to wildlife management.
0190.3.2 Describe carrying capacity as related to wildlife.
0190.3.3 Define horizontal and vertical structuring.
0190.3.4 Explain ecological principles and their application to wildlife management.

Standard 4: Habitat Management Practices (0190.S.4)
Students will determine the relationship between wildlife and the environment with approved practices in managing wildlife habitat.

Habitat Management Practices Objectives
Students will:
0190.4.1 Explain ecological principles applied to fish and wildlife.
0190.4.2 Design a wildlife management plan.
0190.4.3 Identify forest management practices for improving habitat.
0190.4.4 Identify agricultural management practices for improvement of habitat.
0190.4.5 Define and describe wetlands and their use.
0190.4.6 Identify government assistance available for habitat improvement.
0190.4.7 Construct and erect wildlife feeders/nest boxes.

Standard 5: Animal Life Histories (0190.S.5)
Students will use technology to identify the characteristics of wildlife and the relationship between species.

Animal Life Histories Objectives
Students will:

0190.5.1 Identify life cycles of wildlife species.
0190.5.2 Describe interrelationship of wildlife species.
0190.5.3 Identify common relationships between humans and wildlife.
0190.5.4 Search the Internet to secure wildlife information.

Standard 6: Water and Water Quality (0190.S.6)
Students will determine the relationships between water and the environment and the recommended practices for conserving these resources.

Water Objectives
Students will:
0190.6.1 Identify sources of water and water pollutants.
0190.6.2 Explain the effects to water pollution on the ecosystem.
0190.6.3 Identify point and non-point source pollution and describe possible controls.
0190.6.4 Describe wetlands, their use, importance and preservation.
0190.6.5 Explain methods of protecting water sources.

Standard 7: Wildlife Values as a Resource (0190.S.7)
Students will describe the benefit of wildlife as a resource to society.

Wildlife Values Objectives
Students will:
0190.7.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
0190.7.2 Define recreational values of fish and wildlife.
0190.7.3 Describe social values of fish and wildlife.
0190.7.4 Identify esthetic values of fish and wildlife resources.
0190.7.5 Describe scientific and educational values of fish and wildlife.
0190.7.6 Evaluate negative impact of wild animals on humans.

Standard 8: Develop a Work-Based Experiential Program (SAE) in Wildlife Management (0190.S.8)
Students will explore careers and learn the rational for and plan a SAE.

SAE Objectives
Students will:
0190.8.1 Define and explain supervised experience programs in agricultural and natural resources.
0190.8.2 Explore opportunities for work-based learning in natural resources.
0190.8.3 Define record keeping terms for supervised experience programs.
0190.8.4 Establish a supervised experience program in agriculture or natural resources.

Grounds Maintenance

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation.

Standard 1: Leadership and Communication Development (0201.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0201.1.1 Participate in FFA activities and programs.
0201.1.2 Prepare and deliver short speeches.
0201.1.3 Identify interview and employment readiness skills.
0201.1.4 Prepare a resume.

Standard 2: Grounds Maintenance Tools and Equipment (0201.S.2)
Students will practice and demonstrate safety with ground maintenance tools, equipment and activities.

Grounds Maintenance Tools and Equipment Objectives
Students will:
0201.2.1 Identify tools and equipment used in grounds maintenance.
0201.2.2 Perform maintenance and service operations on tools and equipment.
0201.2.3 Use tools and equipment safely under job site conditions.
0201.2.4 Identify and safely use potentially hazardous fuels.

Standard 3: Control Pests in Lawns, Flowers and Shrubs (0201.S.3)
Students will explain the practices of safe pesticide use and the concept of integrated pest management.

Control Pests in Lawns, Flowers and Shrubs Objectives
Students will:
0201.3.1 Identify, calibrate and safely use equipment.
0201.3.2 Identify and use personal safety clothing and equipment.
0201.3.3 Identify common pests, diseases and appropriate control techniques including integrated pest management (IPM).
0201.3.4 Read and demonstrate understanding of pesticide labels.

Standard 4: Plant and Maintain Lawns, Flower Beds, and Shrubs (0201.S.4)
Students will demonstrate practices pertaining to the establishment and maintenance of lawns, flower beds and shrubs.

Plant and Maintain Lawns, Flower Beds, and Shrubs Objectives
Students will:
0201.4.1 Identify safe and appropriate mowing techniques.
0201.4.2 Use an edger following safety procedures.
0201.4.3 Aerate and dethatch turf.
0201.4.4 Irrigate lawn, flowers and shrubs.
0201.4.5 Take soil samples using correct procedures.
0201.4.6 Analyze soil test results and determine fertilizer needs.
0201.4.7 Apply fertilizer and lime to various areas.
0201.4.8 Prune shrubs according to recommended practices.
0201.4.9 Mulch landscape plants.
0201.4.10 Provide appropriate winter protection for plants.

Standard 5: Construct and Maintain Grounds Structures (0201.S.5)
Students will build and maintain permanent structures within a landscaped design.

Grounds Structures Objectives
Students will:
0201.5.1 Mix and pour concrete.
0201.5.2 Build and maintain wood structures.
0201.5.3 Seal asphalt walks and driveways.

Standard 6: Developing Work-Based Experiential Program (SAE) (0201.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0201.6.1 Explore opportunities for supervised agricultural experience programs.
0201.6.2 Establish a supervised agricultural experience program in grounds maintenance.
0201.6.3 Maintain records of experience program activities, expenses and earnings.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Leadership Development (0212.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0212.1.1 Demonstrate an awareness of FFA and its components.
0212.1.2 Utilize record-keeping skills in work-based experience programs.
0212.1.3 Develop and exhibit communication skills.
0212.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0212.1.5 Demonstrate personal and social skills.
0212.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Plant Classification and Identification (0212.S.2)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0212.2.1 Develop an understanding of the natural classification system for the plant kingdom.
0212.2.2 Identify plant species and explore their benefit to people.
0212.2.3 Identify and research plants that are important to the greenhouse industry.
0212.2.4 Describe the plant processes involved with plant growth and development.
0212.2.5 List plant growth regulators and document their effects on plants.
0212.2.6 Explain how essential elements become available for plant use.
0212.2.7 Identify and document the effects of environmental factors on plant growth.
0212.2.8 Compare and contrast types of plant-growing media.
0212.2.9 Determine appropriate amendments for optimum plant growth.
0212.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Plant Processes and Propagation (0212.S.3)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0212.3.1 Perform methods of propagating plants.
0212.3.2 Manipulate total environment from juvenile to mature plant.
0212.3.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Pest Management (0212.S.4)
Students will identify proper pesticide use and pest management.

Pest Management Objectives
Students will:
0212.4.1 Explain and apply the concepts of integrated pest management.
0212.4.2 Identify safety guidelines for tools, equipment and pesticide use.

0212.4.3 Identify pests and evaluate control methods according to label interpretation.
0212.4.4 Recognize, calibrate and operate pesticide application equipment.
0212.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
0212.4.6 Demonstrate knowledge of and interpret federal and state pesticide laws.

Standard 5: Selected Specialty Areas in Horticulture (0212.S.5)
Students will identify the various specialty areas in horticulture.

Specialty Areas in Horticulture Objectives
Students will:
0212.5.1 Explore professions in floriculture and understand the scope of job opportunities.
0212.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.
0212.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.
0212.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.
0212.5.5 Explore professions in nursery production and understand job requirements.
0212.5.6 Demonstrate techniques and procedures used in the nursery production industry.
0212.5.7 Research careers in the landscape and turf industry.
0212.5.8 Perform basic landscape design, plantings and maintenance techniques.
0212.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Laboratory Investigation (0212.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0212.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0212.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0212.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0212.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications (0212.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0212.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in horticulture.
- Locate, evaluate, and collect information from a variety of sources related to horticulture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0212.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0212.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.
0212.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Process/Workplace Skills (0212.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0212.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0212.8.2 Explore careers available in horticulture.
0212.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.
0212.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0212.8.5 Demonstrate correct language usage in all oral and written work.
0212.8.6 Perform effectively in both leadership and non-leadership roles.
0212.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0212.8.8 Participate as a team member to complete a variety of assignments.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Leadership and Communication Development (0213.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0213.1.1 Describe FFA and its components.
0213.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0213.1.3 Identify appropriate career opportunities in the floriculture industry.
0213.1.4 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
0213.1.5 Develop personal relation and communication skills.
0213.1.6 Demonstrate an awareness of employment and floriculture industry ethics.

Standard 2: Principles of Design (0213.S.2)
Students will utilize principles of design to critique floral designs.

Principles of Design Objectives
Students will:
0213.2.1 Utilize floriculture principles, elements and theory of design.
0213.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
0213.2.3 Understand the concepts and use of color.

Standard 3: Cut Flowers and Greens (0213.S.3)
Students will identify and maintain commonly used cut flowers and foliage.

Cut Flowers and Greens Objectives
Students will:
0213.3.1 Identify and classify flowers and foliage.
0213.3.2 Understand the techniques to maintain optimum flower and foliage quality.

Standard 4: Floral Materials and Supplies (0213.S.4)
Students will identify and manipulate materials and supplies used in floral design.

Floral Materials and Supplies Objectives
Students will:
0213.4.1 Identify the basic mechanics and supplies used in floral design.
0213.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
0213.4.3 Demonstrate construction of bows.

Standard 5: Selected Specialty Areas (0213.S.5)
Students will design the appropriate product according to the occasion.

Selected Specialty Areas Objectives
Students will:
0213.5.1 Design boutonnieres and corsages.
0213.5.2 Understand concepts in floral design of holiday arrangements.
0213.5.3 Identify designs for weddings and receptions.
0213.5.4 Recognize practice in sympathy floral designs.
0213.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.

0213.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Floral Operations and Management (0213.S.6)
Students will develop strategies and understand the components used in floral operations and management.

Floral Operations and Management Objectives
Students will:
0213.6.1 Develop skills in retail sales using various selling techniques.
0213.6.2 Develop a visual merchandising plan to project the right image.
0213.6.3 Identify the components and the importance of a floral delivery system.
0213.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts provide students with individual goals and objectives including: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Leadership Development (0214.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0214.1.1 Demonstrate an awareness of FFA and its components.
0214.1.2 Utilize record-keeping skills in work-based experience programs.
0214.1.3 Develop and exhibit communication skills.
0214.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0214.1.5 Demonstrate personal and social skills.
0214.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Greenhouse Structure, Operation and Maintenance (0214.S.2)
Students will identify different greenhouse structures, operations and maintenance.

Greenhouse Structure, Operation and Maintenance Objectives
Students will:
0214.2.1 Identify different greenhouse parts and compare types of structures and coverings.
0214.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
0214.2.3 Diagram operational systems in the greenhouse operation.
0214.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Plant Classification and Identification (0214.S.3)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0214.3.1 Demonstrate an understanding of the natural classification system for the plant kingdom.
0214.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Environmental Control and Plant Growth (0214.S.4)
Students will identify the different environmental elements and plant growth.

Environmental Control and Plant Growth Objectives
Students will:
0214.4.1 Describe the plant processes involved with plant growth and development.
0214.4.2 List plant growth regulators and document their effects on plants.
0214.4.3 Explain how essential elements become available for plant use.
0214.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Greenhouse Media and Containers (0214.S.5)
Students will identify the greenhouse media effects and the different types of containers.

Greenhouse Media and Containers Objectives
Students will:
0214.5.1 Research the components of media and amendments.
0214.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
0214.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Plant Processes and Propagation (0214.S.6)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0214.6.1 Perform methods of propagating plants.
0214.6.2 Manipulate total environment from juvenile to mature plant.
0214.6.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identifying and Controlling Disease, Insects, and Weeds (0214.S.7)
Students will identify and control disease, insects and weeds with proper pesticide usage.

Disease, Insects, and Weeds Objectives
Students will:
0214.7.1 Identify and exhibit guidelines for pesticide use.
0214.7.2 Practice integrated pest management procedures.
0214.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Greenhouse Business Management (0214.S.8)
Students will identify the various types of managing a greenhouse business.

Greenhouse Business Management Objectives
Students will:
0214.8.1 Explore and discuss the various types of records kept in a greenhouse business.
0214.8.2 Use computers to solve problems related to greenhouse management.
0214.8.3 Describe the methods and determine the values and limitations of effective advertising.
0214.8.4 Develop a plan for profitable sales techniques.
0214.8.5 Record receipts and expenditures.

Standard 9: Laboratory Investigation (0214.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0214.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0214.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0214.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0214.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0214.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0214.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in greenhouse technology.
- Locate, evaluate, and collect information from a variety of sources related to greenhouse technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0214.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0214.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.

0214.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Process/Workplace Skills (0214.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0214.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0214.11.2 Explore careers available in greenhouse technology.

0214.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

0214.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0214.11.5 Demonstrate correct language usage in all oral and written work.

0214.11.6 Perform effectively in both leadership and non-leadership roles.

0214.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0214.11.8 Participate as a team member to complete a variety of assignments.

Landscape Design And Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, the students will implement the plan.

Standard 1: Leadership and Interpersonal Skill Development (0215.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0215.1.1 Participate in FFA activities.
0215.1.2 Write, deliver and evaluate a speech and/or presentation.
0215.1.3 Explore careers in the landscape industry.
0215.1.4 Determine appropriate job seeking and keeping skills.
0215.1.5 Describe ethical conduct.
0215.1.6 Utilize record-keeping skills in work-based experience programs (SAE).

Standard 2: Basic Landscape Design (0215.S.2)
Students will recognize and demonstrate basic principles of planning and implementing the landscape design.

Basic Landscape Design Objectives
Students will:
0215.2.1 Determine environmental requirements for landscape plant materials.
0215.2.2 Recognize the appropriate plants for landscape use.
0215.2.3 Interpret landscape symbols for a landscape plan.
0215.2.4 Operate computer assisted design programs.
0215.2.5 Demonstrate knowledge of drafting skills needed in a landscape plan.

Standard 3: Safe Use and Operation of Horticulture Tools and Equipment. (0215.S.3)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0215.3.1 Identify and properly use horticulture tools and equipment.
0215.3.2 Follow appropriate safety procedures and policies.
0215.3.3 Interpret and follow safety information from equipment manuals.
0215.3.4 Maintain and adjust safety devices.
0215.3.5 Service tools and equipment as to manufactures specifications.
0215.3.6 Operate equipment under job site conditions.

Standard 4: Implementation of the Landscape Design (0215.S.4)
Students will apply principles of landscape design.

Landscape Design Objectives
Students will:
0215.4.1 Prepare an area to be landscaped.
0215.4.2 Construct walkways and landscape structures.
0215.4.3 Install balled and burlapped, containerized and bare root plantings.
0215.4.4 Install herbaceous landscape plants.
0215.4.5 Place edging materials.
0215.4.6 Mulch a landscape site.
0215.4.7 Install turf areas.
0215.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. The students will understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Leadership and Interpersonal Skill Development (0216.S.1)
Students will demonstrate leadership skills through personal, organizational, and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0216.1.1 Participate in FFA activities and programs.
0216.1.2 Identify communication skills.
0216.1.3 Identify interview and employment readiness skills.
0216.1.4 Draft a resume.

Standard 2: Demonstrate Safe Use and Operation of Horticulture Tools and Equipment (0216.S.2)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0216.2.1 Identify and properly use horticulture tools and equipment.
0216.2.2 Follow appropriate safety procedures and policies.
0216.2.3 Interpret and follow safety information from equipment manuals.
0216.2.4 Maintain and adjust safety devices.
0216.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
0216.2.6 Operate equipment under job site conditions.
0216.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Using Pest Management Techniques (0216.S.3)
Students will describe safe pesticide use and the concept of integrated pest management.

Pest Management Techniques Objectives
Students will:
0216.3.1 Identify, calibrate, and properly use equipment.
0216.3.2 Identify and use personal safety equipment and protective clothing.
0216.3.3 Identify pests and the appropriate control techniques.
0216.3.4 Introduce Integrated Pest Management (IPM) techniques.
0216.3.5 Interpret pesticide labels and proper use as instructed.
0216.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Demonstrate Proper Landscape Maintenance Techniques (0216.S.4)
Students will maintain the landscape.

Landscape Maintenance Objectives
Students will:
0216.4.1 Determine and follow appropriate lawn care practices.
0216.4.2 Aerate and dethatch turf areas.
0216.4.3 Determine and implement irrigation needs for turf and landscaped areas.
0216.4.4 Identify appropriate soil testing procedures.
0216.4.5 Over-seed, lime, and fertilize as deemed necessary.
0216.4.6 Determine and implement proper pruning timelines and practices.

0216.4.7 Maintain landscape edging materials.
0216.4.8 Mulch landscape planting.
0216.4.9 Maintain landscape structures.
0216.4.10 Describe appropriate winter protection.
0216.4.11 Utilize record-keeping skills in work-based experience programs (SAE).

Business Law

This course focuses on the impact of law as it relates to business and individuals. Students will examine criminal and civil law with a concentration on consumer, contract, property, and employment laws while assessing ethics as they relate to each.

Standard 1: Ethics (1417.S.1)
Examine ethics related to business law.

Relationship of Ethics to Business Law Objectives
Students will:

1417.1.1 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship, and justice.
1417.1.2 Distinguish the various ways in which ethical decisions can be made.
1417.1.3 Describe why laws are needed.
1417.1.4 Explain the relationship between law and ethics and why they sometimes conflict.
1417.1.5 Compare and contrast the five major sources of today's law. (Federal and state constitutions, English common law, statutes, court decisions, and administrative law).

Standard 2: Criminal, Civil and Business Law (1417.S.2)
Identify the elements of criminal, civil and business law including trial procedures.

Elements of Criminal and Civic Law Objectives
Students will:

1417.2.1 Describe and define different types of crimes.
1417.2.2 Determine defenses to criminal acts.
1417.2.3 Distinguish between a tort and a crime.
1417.2.4 Differentiate between and give examples of negligence and intentional torts.
1417.2.5 Explain the concepts of the reasonable person test and proximate cause.
1417.2.6 Explain the concept of strict/absolute liability.
1417.2.7 Enumerate the steps in a civil and a criminal trial.
1417.2.8 Describe crimes affecting business.
1417.2.9 Explain civil rights when being accused of a crime.
1417.2.10 Distinguish between different types of courts.
1417.2.11 Explain duties of jurors and witnesses.

Standard 3: Contracts (1417.S.3)
Analyze contracts.

Contract Objectives
Students will:

1417.3.1 Identify the elements of a contract (offer, acceptance, genuine agreement, consideration, capacity, and legality).
1417.3.2 Discuss the requirements of an offer and acceptance and how the offer can be terminated/discharged.
1417.3.3 Explain a minor's right to avoid a contract and identify people who lack contractual capacity.
1417.3.4 List the essential information that should be included in writing under the statute of frauds.
1417.3.5 Explain the parole evidence rule.
1417.3.6 Describe breach of contract and the remedies available when a contract is breached.

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.9-12.4.1 use telecommunications and online resources for the purpose of communicating with audiences inside and outside of the classroom.

Performance Descriptors (TEC.PD.9-12.4)
- **Mastery**
  High school students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report result;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.9-12.5.1 use a variety of strategies to acquire information from electronic resources;
TEC.9-12.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.9-12.5)
- **Mastery**
  High school students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems; routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.9-12.6.1 investigate and apply expert systems, intelligent agents, and simulations in real world situations.

Performance Descriptors (TEC.PD.9-12.6)
- **Mastery**
  High school students performing at the mastery level select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning.

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.

David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions.. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Note: The content standards and objectives for Technical and Adult Education do not include performance descriptors.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts, the WVEIS course code for technical courses);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1. 0101.S.1 refers to Agriculture and Natural Resources I content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology, the WVEIS code for technical courses);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses, ~~and~~ grades 11-12 science courses, and technical courses, which use no grade designation);
- The number of the content standard addressed; and

- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard. 0101.1.1 refers to Agriculture and Natural Resources I content standard #1, objective #1.

Numbering of Performance Descriptors

The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)

Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this ~~version~~ section of Policy 2520 is ~~"200112."~~ "200207, indicating that the Board approval date is ~~December 2001~~ July, 2002.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

Agriculture and Natural Resources I

This area of study is designed to provide students with core skills and competencies needed for pursuing careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Orientation to the Agriculture and Natural Resource Industries (0101.S.1)
Students will:

- describe the natural resource industry.

Agriculture and Natural Resource Industries Objectives
Students will:

0101.1.1 Identify appropriate career opportunities in agriculture and natural resources.
0101.1.2 Relate the importance of agriculture and natural resources to state, national and international economies.
0101.1.3 Identify major agricultural and natural resources issues.
0101.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Leadership in Agriculture and Natural Resources (0101.S.2)
Students will:

- show leadership skills necessary for success in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0101.2.1 Participate in meetings using parliamentary law.
0101.2.2 Use interpersonal skills in team problem solving.
0101.2.3 Prepare and deliver a brief presentation on an agricultural or natural resources topic.

Standard 3: Developing Work-Based Experience Program (0101.S.3)
Students will:

- develop work-based experience programs in agriculture and natural resources.

Developing Work-Based Experience Program Objectives
Students will:

0101.3.1 Define and explain supervised experience programs in agriculture and natural resources.
0101.3.2 Explore opportunities for work-based experiences through supervised experience programs.
0101.3.3 Define record keeping terms for supervised experience programs.
0101.3.4 Complete budgets for potential supervised experience programs.
0101.3.5 Establish a supervised experience program in agriculture or natural resources.
0101.3.6 Utilize marketing principles.
0101.3.7 Demonstrate competency in agriscience problem solving.

Standard 4: Computer Applications in Agriculture and Natural Resources (0101.S.4)
Students will:

- Display skills involving computer application in natural recourses.

Computer Applications in Agriculture and Natural Resources Objectives
Students will:

0101.4.1 Utilize keyboarding skills to operate agriculture and natural resources software.
0101.4.2 Search the Internet to secure agriculture and natural resources information.

Standard 5: Applying Basic Mechanical Skill in Agriculture and Natural Resources (0101.S.5)
Students will:

- demonstrate basic mechanical skills.

Basic Mechanical Skill in Agriculture and Natural Resources Objectives
Students will:
0101.5.1 Demonstrate principles of safety.
0101.5.2 Demonstrate basic tool conditioning skills.
0101.5.3 Demonstrate basic carpentry skills.
0101.5.4 Demonstrate basic welding skills.
0101.5.5 Demonstrate basic cold metal skills.

Standard 6: Introductory Animal Science and Production (0101.S.6)
Students will:
- demonstrate animal science and production skills.

Animal Science and Production Objectives
Students will:
0101.6.1 Explore various animal production opportunities.
0101.6.2 Explain management/health requirements of animals.
0101.6.3 Identify desirable characteristics for selecting large and small animals.
0101.6.4 Identify different types of animal digestive systems.

Standard 7: Introductory Plant Science and Production (0101.S.7)
Students will:
- demonstrate plant science and production skills.

Introductory Plant Science and Production Objectives
Students will:
0101.7.1 Explore various plant production opportunities.
0101.7.2 Explain plant production requirements (macronutrients, micronutrients, pH).
0101.7.3 Identify the major parts of a plant.
0101.7.4 Describe the function of the major parts of a plant.

Standard 8: Basic Environmental Concerns (0101.S.8)
Students will:
- demonstrate basic environmental skills.

Basic Environmental Concerns Objectives
Students will:
0101.8.1 Explain major environmental concerns - e.g. acid rain, air pollution, soil degradation and surface and groundwater pollution.
0101.8.2 Use measurement devices to collect and test soil and water samples.
0101.8.3 Explain the concepts of soil science and their relationship to agriculture.

Standard 9: Investigations and Problem Solving (0101.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0101.9.1 Engage in hands-on activities demonstrating agriscience and natural resources concepts and principles.

Agriculture and Natural Resources II

This area of study is designed to provide students with core skills and competencies needed for pursuing advanced careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Developing Work Based (0102.S.1)
Students will:

- develop a work based experience program.

Developing Work Based Objectives
Students will:

0102.1.1 Analyze records of supervised experience programs to make sound decisions for expanding.
0102.1.2 Identify marketing trends and cycles.
0102.1.3 Identify employment trends and cycles.
0102.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Computer Applications (0102.S.2)
Students will:

- utilize computer applications in agriculture and natural resources.

Computer Applications Objectives
Students will:

0102.2.1 Use computer resources to solve problems related to work-based experience programs.

Standard 3: Ecosystem Management (0102.S.3)
Students will:

- understand ecosystem management.

Ecosystem Management Objectives
Students will:

0102.3.1 Explain the impact of agriculture and forestry on ecosystems.
0102.3.2 Explain the relationship of wetlands to agriculture and natural resources.
0102.3.3 Test, interpret and analyze water and soil test data.

Standard 4: Leadership in Agriculture and Natural Resources (0102.S.4)
Students will:

- display leadership skills in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0102.4.1 Conduct meetings using parliamentary law.
0102.4.2 Serve as a small group team leader.
0102.4.3 Present prepared and extemporaneous speeches on issues affecting agriculture and natural resources.
0102.4.4 Participate in committees and leadership development activities.
0102.4.5 Participate in committee service.

Standard 5: Application of Mechanical Skills (0102.S.5)
Students will:

- apply mechanical skills to augment agriculture and natural resource activities.

Application of Mechanical Skills Objectives
Students will:
0102.5.1 Read and transfer measurements.
0102.5.2 Develop bill of materials and calculate costs.
0102.5.3 Demonstrate advanced tool conditioning skills.
0102.5.4 Demonstrate advanced welding skills.
0102.5.5 Demonstrate building construction skills.
0102.5.6 Service and maintain small engines.
0102.5.7 Apply mechanical skills in repair and construction projects related to supervised experience programs.

Standard 6: Advanced Animal Science and Production (0102.S.6)
Students will:
- demonstrate advanced animal science reproduction skills.

Advanced Animal Science and Production Objectives
Students will:
0102.6.1 Compare animal digestive systems.
0102.6.2 Analyze nutrient requirements of animals and calculate rations.
0102.6.3 Identify symptoms of nutrient deficiencies.
0102.6.4 Describe the use of feed additives and growth stimulants.
0102.6.5 Explain the role of breeding and selection in animal improvement.
0102.6.6 Recognize steps to maintain animal health.
0102.6.7 Explain biotechnology applications in animal production.

Standard 7: Advanced Plant Science and Production (0102.S.7)
Students will:
- demonstrate advanced plant science and production skills.

Advanced Plant Science and Production Objectives
Students will:
0102.7.1 Describe approved practices in plant nutrition.
0102.7.2 Identify symptoms and management strategies for plant nutrient deficiencies.
0102.7.3 Identify pest management measures.
0102.7.4 Explain biotechnology applications in plant production.

Standard 8: Forestry (0102.S.8)
Students will:
- exhibit skills enhancing selective forestry activities.

Forestry Objectives
Students will:
0102.8.1 Identify trees of major economic importance.
0102.8.2 Identify relationships among forests, wildlife and water resources.
0102.8.3 Select best management practices for timber stand improvement.

Standard 9: Investigations and Problem Solving (0102.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0102.9.1 Students will engage in advanced hands-on activities relating to agriscience and natural resources concepts.

Agriculture Mechanics I

This area of study is designed to provide learners with job entry-level skills in the agricultural mechanics industry. Major instructional concepts include an orientation to mechanics industry, leadership, safety, drawing and blueprinting, shop, hand and power tools.

Standard 1: Orientation to the Agricultural Mechanics Industry (0112.S.1)
Students will:

- describe mechanics as a career.

Agricultural Mechanics Industry Objectives
Students will:
0112.1.1 Identify various career opportunities in agricultural mechanics.
0112.1.2 Develop computer skills.
0112.1.3 Develop resume and job seeking skills.

Standard 2: Leadership in Agricultural Mechanics (0112.S.2)
Students will:

- participate effectively in a group (FFA) setting.

Leadership in Agricultural Mechanics Objectives
Students will:
0112.2.1 Define the function and history of the FFA.
0112.2.2 Identify parliamentary procedure skills need to conduct a meeting.
0112.2.3 Perform individual leadership skills in preparing and presenting a speech.
0112.2.4 Prepare and identify components of a program of activities.

Standard 3: Understanding Safety and Fire Control Procedures (0112.S.3)
Students will:

- maintain a safe working environment.

Understanding Safety and Fire Control Procedures Objectives
Students will:
0112.3.1 Utilize personal safety devices.
0112.3.2 Identify general shop safety rules.
0112.3.3 Maintaining a safe working environment.
0112.3.4 Identify and comply with safety rules relating to operation of farm tractors and equipment.

Standard 4: Understanding and Interpreting Drawing and Blueprints (0112.S.4)
Students will:

- use blueprints to plan projects.

Understanding and Interpreting Drawing and Blueprints Objectives
Students will:
0112.4.1 Apply dimensions to drawings and free hand sketches.
0112.4.2 Calculate costs and bill of materials.

Standard 5: Using Shop Hand and Power Tools (0112.S.5)
Students will:

- safely and correctly demonstrate metal fabrication.

Using Shop Hand and Power Tools Objectives
Students will:

0112.5.1 Identify and use common hand tools and power equipment.
0112.5.2 Perform cold metal procedures - cutting, drilling and threading.
0112.5.3 Perform various arc-welding functions.
0112.5.4 Perform various oxy-acetylene tasks.
0112.5.5 Conduct arc welding projects that relate to SAEs.

Standard 6: Technology Applications (0112.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0112.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0112.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0112.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural mechanics.
0112.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0112.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:

0112.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0112.7.2 Explore careers available in agricultural mechanics.
0112.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0112.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0112.7.5 Demonstrate correct language usage in all oral and written work.
0112.7.6 Perform effectively in both leadership and non-leadership roles.
0112.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0112.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0112.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives

Students will:

0112.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0112.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0112.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0112.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agricultural Mechanics II

This area of study provides students with more advanced concepts and practical application in the areas of leadership, computer application, ag engines, structures, electricity and fencing.

Standard 1: Introduction to Basic Principles of Agricultural Engines – Gasoline and Diesel (0113 .S.1)
Students will:

- **learn the basic principles of agricultural engines – gasoline and diesel.**

Gasoline and Diesel Objectives
Students will:

0113.1.1 Interpret basic principles of agricultural engines.
0113.1.2 Apply principles of tune-up procedure.
0113.1.3 Perform engine overhauls.
0113.1.4 Demonstrate problem solving in operation and maintenance of engines.
0113.1.5 Identify hydraulic systems.
0113.1.6 Identify and use diagnostic testing equipment.

Standard 2: Agricultural Structures (0113.S.2)
Students will:

- **use agriculture construction techniques.**

Agricultural Structures Objectives
Students will:

0113.2.1 Identify basic building construction techniques related to agricultural structures.
0113.2.2 Select and install appropriate fasteners.
0113.2.3 Select kinds and grades of lumber for the job.
0113.2.4 Identify roof designs and materials.
0113.2.5 Exhibit concrete and masonry skills.
0113.2.6 Identify, select and use plumbing fixtures.
0113.2.7 Select and use various painting and finishing materials.

Standard 3: Agricultural Electricity (0113.S.3)
Students will:

- **use proper safety in electrical wiring.**

Agricultural Electricity Objectives
Students will:

0113.3.1 Demonstrate electrical theory and skills with agricultural electrical units.
0113.3.2 Identify terminology, circuits, breakers, switches and service entrance panels based on state codes.
0113.3.3 Identify, select and use electric motors, motor controls, pulley sizes and speeds.
0113.3.4 Demonstrate proper safety procedures in all electrical work.

Standard 4: Fencing (0113.S.4)
Students will:

- **explore fencing for agricultural applications.**

Fencing Objectives
0113.4.1 Identify and understand the various types of fencing, tools and equipment.

0113.4.2 Analyze the economics of various fencing systems.

Standard 5: Agricultural Equipment (0113.S.5)
Students will:

- **maintain, adjust and repair agricultural equipment.**

Agricultural Equipment Objectives
Students will:

0113.5.1 Identify agricultural machinery and equipment.
0113.5.2 Perform maintenances procedures as recommended in service manuals.
0113.5.3 Identify agricultural lubricants and fuels.

Standard 6: Technology Applications (0113.S.6)
Students will:

- **apply technology to investigate real-world problems.**

Technology Applications Objectives
Students will:

0113.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0113.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0113.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to a agricultural mechanics.
0113.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of an agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0113.S.7)
Students will:

- **demonstrate personal and group workplace skills.**

Process/Workplace Skills in Agribusiness Objectives
Students will:

0113.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0113.7.2 Explore careers available in agricultural mechanics.
0113.7.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural mechanics.
0113.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0113.7.5 Demonstrate correct language usage in all oral and written work.
0113.7.6 Perform effectively in both leadership and non-leadership roles.
0113.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0113.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Lab Investigation (0113.S.8)
Students will :

- **safely conduct laboratory investigations and exploratory learning.**

Lab Investigation Objectives

Students will:

0113.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0113.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0113.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0113.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agribusiness Management

Agribusiness management is for students who seek further agriculture, business, advancement and management techniques that will enable them to become successful in owning and operating a business.

Standard 1: Agribusiness Concepts (0131.S.1)
Students will:
- Identify different types of business organizations.

Agribusiness Concepts Objectives
Students will:
0131.1.1 Identify agribusiness organizational structures.
0131.1.2 Distinguish between partnership, limited partnership and joint venture.
0131.1.3 Describe regular and sub-chapter S corporations.
0131.1.4 Explain the difference between cooperatives and corporations.

Standard 2: Agripreneurship (0131.S.2)
Students will:
- describe the risks and rewards of becoming an entrepreneur.

Agripreneurship Objectives
Students will:
0131.2.1 Define entrepreneurship.
0131.2.2 Recognize advantages and disadvantages of being self-employed.
0131.2.3 Identify personal characteristics of successful agripreneurs.
0131.2.4 Explain why businesses succeed.

Standard 3: Preparing a Business Plan (0131.S.3)
Students will:
- develop a business plan and technical resources.

Preparing a Business Plan Objectives
Students will:
0131.3.1 Identify and complete the components of a business plan.
0131.3.2 Prepare a cash flow statement for a proposed agribusiness.
0131.3.3 Identify sources of technical assistance in establishing and maintaining a successful business.
0131.3.4 Explain risk management.

Standard 4: Business Law (0131.S.4)
Students will:
- identify the basic business law involved in agriculture.

Business Law Objectives
Students will:
0131.4.1 Identify the types and sources of laws.
0131.4.2 Describe liability and negligence laws.
0131.4.3 Describe health and safety regulations.
0131.4.4 Identify legal requirements and common laws and legal documentation of a successful business operation.

Standard 5: Marketing and Sales Management (0131.S.5)
Students will:

- develop a marketing and sales plan.

Marketing and Sales Management Objectives
Students will:
0131.5.1 Develop and maintain a marketing strategy.
0131.5.2 Explain methods of advertising.
0131.5.3 Identify sources of information in using marketing research.
0131.5.4 Demonstrate successful marketing techniques.

Standard 6: Financial Management (0131.S.6)
Students will:
- develop various financial records of an agribusiness.

Financial Management Objectives
Students will:
0131.6.1 Use computers in maintaining business documents and records.
0131.6.2 Use computers to make sales and business projections.
0131.6.3 Prepare sales literature and advertisements.

Standard 7: Technology Applications in Agribusiness (0131.S.7)
Students will:
- apply technology to investigate real-world problems.

Technology Applications in Agribusiness Objectives
Students will:
0131.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0131.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0131.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0131.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 8: Process/Workplace Skills in Agribusiness (0131.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:
0131.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0131.8.2 Explore careers available in agribusiness.
0131.8.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0131.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0131.8.5 Demonstrate correct language usage in all oral and written work.
0131.8.6 Perform effectively in both leadership and non-leadership roles.
0131.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0131.8.8 Participate as a team member to complete a variety of assignments.

Agricultural Biotechnology

This course is designed to provide knowledge, skills and competencies regarding the application of biotechnology to agriscience. The course establishes a basic understanding of biotechnology, genetics, and agricultural applications and explores related careers.

Standard 1: Orientation to Biotechnology (0132.S.1)
Students will:

- research application of biotechnology in agriscience.

Biotechnology Objectives
Students will:

0132.1.1 Investigate biotechnology and its applications to agriscience.
0132.1.2 Research the biotechnology industry and make predictions regarding future uses in agriscience and the impact on the industry and consumer.

Standard 2: Genetics and Genetic Engineering (0132.S.2)
Students will:

- describe genetic engineering.

Genetics and Genetic Engineering Objectives
Students will:

0132.2.1 Define and exhibit an understanding of basic genetic terms.
0132.2.2 Explain the concept of habitability.
0132.2.3 Compare and contrast methods of transferring genetic information.
0132.2.4 Relate the concepts of dominant and recessive genes to common heritable traits.
0132.2.5 Explain and simulate recombinant DNA procedures.
0132.2.6 Explain and perform procedures used in tissue culturing.
0132.2.7 Research emerging methods of genetic engineering.
0132.2.8 Properly and safely manipulate equipment and procedures used in performing genetic engineering tasks.

Standard 3: The Application of Biotechnology to Animal Management and Reproduction (0132.S.3)
Students will:

- apply principles of biotechnology to animal production.

Animal Management and Reproduction Objectives
Students will:

0132.3.1 Apply principles of biotechnology to animal selection.
0132.3.2 Apply principles of biotechnology to animal health.
0132.3.3 Apply principles of biotechnology to the management of animal waste.
0132.3.4 Explore the application of artificial insemination in animal science.
0132.3.5 Describe the purposes and procedures of embryo transfer.
0132.3.6 Investigate and discuss the application of biotechnology to estrus manipulation.
0132.3.7 Explore developments in biotechnology regarding gender selection.

Standard 4: The Application of Biotechnology to Plant Propagation, Growth and Development (0132.S.4)
Students will:

- apply principles of biotechnology to plant production.

Plant Propagation, Growth and Development Objectives
Students will:

0132.4.1 Design, conduct, evaluate and revise experiments related to the application of biotechnology to both sexual and asexual plant propagation.
0132.4.2 Perform various tissue culturing techniques.
0132.4.3 Discuss the stages of plant growth and investigate and analyze alterations in plant growth as a result of biotechnology.
0132.4.4 Evaluate the impact of biotechnology on making plants more resistant to insects, diseases and frost.

Standard 5: Laboratory Investigation (0132.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0132.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0132.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0132.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0132.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Ethical Questions Created by Biotechnology (0132.S.6)
Students will:

- demonstrate an understanding of ethical issues associated with biotechnology.

Ethical Questions Created by Biotechnology Objectives
Students will:

0132.6.1 Examine ethical questions raised by biotechnology.
0132.6.2 Distinguish the difference between fact and opinion.

Standard 7: Leadership Development for the Biotechnology Industry (0132.S.7)
Students will:

- research and debate issues in biotechnology.

Biotechnology Industry Objectives
Students will:

0132.7.1 Obtain current information from printed sources and the Internet concerning biotechnology and evaluate for accuracy.
0132.7.2 Debate biotechnology issues.

Standard 8: Technology Applications (0132.S.8)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0132.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural biotechnology.
- Locate, evaluate, and collect information from a variety of sources related to agricultural biotechnology.
- Develop positive attitudes toward technology uses that support lifelong learning,

collaboration, personal pursuits, and productivity.

0132.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0132.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural biotechnology.

0132.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural biotechnology.

Standard 9: Process/Workplace Skills (0132.S.9)

Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives

Students will:

0132.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0132.9.2 Explore careers available in agricultural biotechnology.

0132.9.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural biotechnology.

0132.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0132.9.5 Demonstrate correct language usage in all oral and written work.

0132.9.6 Perform effectively in both leadership and non-leadership roles.

0132.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0132.9.8 Participate as a team member to complete a variety of assignments.

Agricultural Cooperative Education

This course is designed for seniors in agricultural education classes. Students must be their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and receive school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. This course will give students experience in a potential agricultural career.

- **Standard 1: Orientation (0133.S.1)**

Students will:

- prepare for employment

- **Orientation Objectives**

Students will:

0133.1.1 Determine areas of major interest in agriculture (production, agribusiness, entrepreneurship).
0133.1.2 Complete required information sheet and papers for program.
0133.1.3 Identify required policies.
0133.1.4 Establish experience program record-book procedures.
0133.1.5 Establish an appropriate training program and evaluation procedures.

- **Standard 2: Interpersonal Skill Development (0133.S.2)**

Students will:

- develop skills necessary to maintain employment.

- **Interpersonal Skill Development Objectives**

Students will:

0133.2.1 Develop an understanding of employer/employee relationships.
0133.2.2 Establish job-site ethics.
0133.2.3 Describe appropriate dress, etiquette and health habits.
0133.2.4 Determine job skills and responsibilities.
0133.2.5 Budget time effectively for job completion.
0133.2.6 Develop leadership and decision-making skills.
0133.2.7 Demonstrate a courteous attitude to customers, employers and fellow employees.
0133.2.8 Display willingness to learn new techniques and follow directions.

- **Standard 3: Job Site Safety Skills (0133.S.3)**

Students will:

- demonstrate a safety "attitude."

- **Job Site Safety Skills Objectives**

Students will:

0133.3.1 Establish a safe working environment.
0133.3.2 Obtain appropriate training from supervisor using acceptable procedures.
0133.3.3 Identify procedures for reporting safety violations.
0133.3.4 Identify the location of first aid kits, emergency phone numbers and exits.
0133.3.5 Demonstrate proper use of equipment.

- **Standard 4: Career Awareness and Employment Skills (0133.S.4)**

Students will:

- develop documents and skills to obtain employment.

- **Career Awareness and Employment Skills Objectives**

Students will:

0133.4.1 Identify areas of potential career interests.
0133.4.2 Determine contents of job application and complete a letter of application.
0133.4.3 Compose an appropriate job resume.
0133.4.4 Demonstrate job-interviewing skills.
0133.4.5 Identify methods to locate potential jobs.

- **Standard 5: Technology Applications (0133.S.5)**

Students will:

- apply technology to investigate real-world problems.

- **Technology Applications Objectives**

Students will:

0133.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0133.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0133.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0133.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

- **Standard 6: Process/Workplace Skills in Agribusiness (0133.S.6)**

Students will:

- demonstrate personal and group workplace skills.

- **Process/Workplace Skills in Agribusiness Objectives**

Students will:

0133.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0133.6.2 Explore careers available in agribusiness.
0133.6.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0133.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0133.6.5 Demonstrate correct language usage in all oral and written work.
0133.6.6 Perform effectively in both leadership and non-leadership roles.
0133.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0133.6.8 Participate as a team member to complete a variety of assignments.

- **Standard 7: Lab Investigation (0133.S.7)**

Students will:

- safely conduct laboratory investigations and exploratory learning.

- **Lab Investigation Objectives**

Students will:

0133.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0133.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0133.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0133.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

**Credit varies according to school-release time for placement. In most cases, the program will involve 2 hours/3 credits.*

Agricultural Experience Program

Students enrolled in agricultural education courses have the unique opportunity for experiential learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course code provides county school systems the vehicle whereby credit can be awarded for such individual student agricultural experiences occurring as an outgrowth from other agricultural education courses.

Standard 1: Selecting Supervised Agricultural Experience Program (0134.S.1)
Students will:

- Identify and investigate appropriate enterprises for SAE.

Supervised Agricultural Experience Program (SAE) Objectives
Students will:

0134.1.1 Define and explain the meaning and purpose of SAE.
0134.1.2 Complete a personal interest and resource inventory to identify an appropriate potential SAE.
0134.1.3 Explore and become engaged in appropriate agricultural enterprises through placement and/or entrepreneurship.

Standard 2: Maintaining Supervised Agricultural Experience Program Records (0134.S.2)
Students will:

- accurately maintain SAE records.

Supervised Agricultural Experience Program Records Objectives
Students will:

0134.2.1 Explain the types of records utilized in agricultural enterprises.
0134.2.2 Define and demonstrate the use of net worth statements, inventories, income and expense logs and other pertinent financial records.
0134.2.3 Maintain neat and accurate records for individual SAEs.

Standard 3: Evaluating and Improving Supervised Agriculture Experience Program (0134.S.3)
Students will:

- summarize and evaluate progress in individual SAEs.

Evaluating and Improving Supervised Agriculture Experience Program Objectives
Students will:

0134.3.1 Summarize financial records to determine net income from the SAE.
0134.3.2 Calculate efficiency factors related to individual SAEs.
0134.3.3 Explore opportunities for SAE expansion and/or improvement.
0134.3.4 Research and examine career opportunities related to individual SAEs.

Agriscience 11

This area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, and leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Agricultural Buildings And Equipment (0135.S.1)
Students will:

- apply agricultural mechanical skills in solving agriscience problems.

Agricultural Buildings and Equipment Objectives
Students will:

0135.1.1 Compare and contrast fencing systems, materials, tools and management practices.
0135.1.2 Analyze and discuss types of agricultural buildings and related construction.
0135.1.3 Interpret agricultural equipment service manuals and maintenance schedules.
0135.1.4 Perform basic transit procedures.

Standard 2: Pesticide Safety and Management (0135.S.2)
Students will:

- describe basic pesticide safety.

Pesticide Safety and Management Objectives
Students will:

0135.2.1 Investigate and discuss pesticide types and pest control.
0135.2.2 Examine control methods, chemical formulation and equipment used to control pests in the greenhouse.
0135.2.3 Identify information on a pesticide label.
0135.2.4 Explore the safe handling and disposal of pesticides.
0135.2.5 Identify and perform the steps in calibrating a sprayer.
0135.2.6 Research integrated pest management.

Standard 3: Health and Care of Farm Related Animals (0135.S.3)
Students will:

- explain how to maintain animal health.

Health and Care of Farm Related Animals Objectives
Students will:

0135.3.1 Investigate and discuss the symptoms of unhealthy animals.
0135.3.2 Identify and diagnose symptoms of disease and parasites.
0135.3.3 Analyze the treatment and prevention of animal disease.
0135.3.4 Utilize techniques in administering medicine and immunizing.
0135.3.5 Examine the treatment and prevention of animal parasites.
0135.3.6 Identify and illustrate the methods for administering medicines to animals.
0135.3.7 Design and utilize a herd health program.
0135.3.8 Differentiate between animal welfare and animal rights.

Standard 4: Work-based Experiential Programs (Supervised Agricultural Experience Programs) (0135.S.4)
Students will:

- conduct work-based experience programs.

Work-based Experiential Programs Objectives
Students will:
0135.4.1 Complete and summarize record book enterprises related to students Supervised Agricultural Experience Program.
0135.4.2 Calculate efficiency factors related to students Supervised Agricultural Experience Program.

Standard 5: Managing Farm Woodlots (0135.S.5)
Students will:
- describe farm woodlot management.

Managing Farm Woodlots Objectives
Students will:
0135.5.1 Compare and contrast the methods of identifying trees.
0135.5.2 Identify trees common to West Virginia.
0135.5.3 Evaluate major forest type and primary uses.
0135.5.4 Measure tree height and diameter.
0135.5.5 Identify and utilize units of measurement (mile, rod, chair & acre).
0135.5.6 Calculate the number of acres in a timber tract.
0135.5.7 Examine the habitat necessary for wildlife.

Standard 6: Laboratory Investigations/Hands-on Learning (0135.S.6)
Students will:
- safely conduct laboratory investigation and exploratory learning.

Laboratory Investigations/hands-on Learning Objectives
Students will:
0135.6.1 Engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0135.6.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0135.6.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0135.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 7: Leadership Development in Agriscience (0135.S.7)
Students will:
- display leadership skills in Agriscience

Leadership Development in Agriscience Objectives
Students will:
0135.7.1 Conduct meetings using parliamentary law.
0135.7.2 Serve as a small group team leader.
0135.7.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0135.7.4 Engage in committees and leadership development activities.
0135.7.5 Model and exhibit community service.

Standard 8: Principles of Safety (0135.S.8)
Students will:
- demonstrate principles of safety.

Principles of Safety Objectives
Students will:
0135.8.1 Wear appropriate protective gear.
0135.8.2 Maintain a safe working environment.
0135.8.3 Identify and engage in safety practices on the farm and in the work place.

Standard 9: Technology Applications (0135.S.9)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0135.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agriscience.
- Locate, evaluate, and collect information from a variety of sources related to agriscience.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0135.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0135.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agriscience.

0135.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agriscience.

Standard 10: Process/Workplace Skills (0135.S.10)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0135.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0135.10.2 Explore careers available in agriscience.

0135.10.3 Use a variety of sources to investigate the educational requirements of various careers in agriscience.

0135.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0135.10.5 Demonstrate correct language usage in all oral and written work.

0135.10.6 Perform effectively in both leadership and non-leadership roles.

0135.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0135.10.8 Participate as a team member to complete a variety of assignments.

Agriscience 12

The area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Appling Agriculture Mechanic Skills (0136.S.1)
Students will:

- apply agriculture mechanic skills in solving problems in agriscience.

Appling Agriculture Mechanic Skills Objectives
Students will:

0136.1.1 Tune-up and perform maintenance procedures on agricultural engine driven machines.
0136.1.2 Perform basic electrical wiring skills.
0136.1.3 Adjust and maintain hay equipment.
0136.1.4 Form, mix, pour and finish concrete.

Standard 2: Land Use Capabilities and Soil Conservation (0136.S.2)
Students will:

- demonstrate land use capabilities and soil conservation in agriscience.

Land Use Capabilities and Soil Conservation Objectives
Students will:

0136.2.1 Evaluate and classify soils according to land use factors.
0136.2.2 Define and determine physical properties of soil.
0136.2.3 Recommend land use and soil conservation practices.
0136.2.4 Test soil and analyze fertility recommendations.
0136.2.5 Explain the function and management of soil pH.
0136.2.6 Describe the process of soil testing.
0136.2.7 Interpret and apply data generated by soil testing.

Standard 3: Landscape Design and Turfgrass Management (0136.S.3)
Students will:

- engage in activities in landscape design and turfgrass management.

Landscape Design and Turfgrass Management Objectives
Students will:

0136.3.1 Identify turfgrass species, purposes and desired locations.
0136.3.2 Explain steps for turfgrass establishment.
0136.3.3 Calculate fertilizer application rates.
0136.3.4 Identify common turf insects, weeds, diseases and biological control.
0136.3.5 Identify ornamental tree and shrubs.
0136.3.6 Select trees and shrubs for appropriate landscape use.
0136.3.7 Install and maintain landscape plant materials.

Standard 4: Animal Reproduction (0136.S.4)
Students will:

- display a working knowledge of animal reproduction.

Animal Reproduction Objectives
Students will:
0136.4.1 Describe genetic principles of animal breeding.
0136.4.2 Identify parts of the male and female reproductive tracts.
0136.4.3 Explain the estrus cycle and gestation period of farm animals.
0136.4.4 Describe techniques of artificial insemination, embryo transplant and pregnancy testing.
0136.4.5 Select breeding stock using performance test data.
0136.4.6 Identify biotechnology implications for animal production.

Standard 5: Farm and Agribusiness Financing (0136.S.5)
Students will:
- engage in activities to augment the understanding of farm and agribusiness financing.

Farm and Agribusiness Financing Objectives
Students will:
0136.5.1 Describe the economic principles of supply and demand.
0136.5.2 Identify sources of credit.
0136.5.3 Calculate simple interest on a loan.
0136.5.4 Explain income tax requirements.
0136.5.5 Identify the functions of government agricultural agencies and programs.
0136.5.6 Describe the steps in planning an agribusiness.

Standard 6: Employment Skills (0136.S.6)
Students will:
- conduct activities designed to enhance employment skills.

Employment Skills Objectives
Students will:
0136.6.1 Identify personal traits necessary to secure and maintain a job.
0136.6.2 Initiate a job search.
0136.6.3 Develop a resume.
0136.6.4 Complete a job application.
0136.6.5 Participate in simulated job interviews.

Standard 7: Work Based Experience (0136.S.7)
Students will:
- conduct activities designed to enhance employment skills.

Work Based Experience Objectives
Students will:
0136.7.1 Complete and summarize record book enterprises related to students supervised agricultural experience program.
0136.7.2 Calculate efficiency factors related to students supervised agricultural experience program.

Standard 8: Computer Application (0136.S.8)
Students will:
- engage in computer applications in agriscience.

Computer Application Objectives
Students will:
0136.8.1 Use computer resources to solve problems related to work-based experience programs.

Standard 9: Leadership in Agriscience (0136.S.9)
Students will:

- develop leadership skills in agriscience.

Leadership in Agriscience Objectives
Students will:
0136.9.1 Conduct meetings using parliamentary law.
0136.9.2 Serve as a small group team leader.
0136.9.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0136.9.4 Participate in committee and leadership development activities.
0136.9.5 Participate in community services.

Standard 10: Safety (0136.S.10)
Students will:
- demonstrate principles of safety.

Safety Objectives
Students will:
0136.9.1 Wear appropriate protective gear.
0136.9.2 Maintain a safe working environment.
0136.9.3 Identify safety practices on the farm and in the work place.

Animal And Veterinary Science – Large Animals

This course is designed to give students advanced knowledge of veterinary science, which includes the study of large farm animals (horses, cattle, sheep, goats and swine). This course will provide an understanding of breeds, animal health, nutrition, anatomy and physiology, training, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of large animals and their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0137.S.1)
Students will participate in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0137.1.1 Participate in committee and leadership development activities associated with FFA.
0137.1.2 Complete and summarize records of SAE Program and health program on individual animals.
0137.1.3 Shadow appropriate career opportunities in Veterinary Medicine.
0137.1.4 Initiate a job search and complete application for entry into college level programs in Veterinary Science.
0137.1.5 Develop communication skills through prepared and extemporaneous speaking.

Standard 2: History And Selection of Farm Animals (0137.S.2)
Students will examine the history and selection of farm animals.

History and Selection of Farm Animals Objectives
Students will:
0137.2.1 Trace the history of domestic farm animals and relate it to human and animal health.
0137.2.2 Classify farm animals according to purposes/use.
0137.2.3 Identify breeds of large animals (horses, cattle, sheep, goats, swine).
0137.2.4 Relate the characteristics of breeds to methods of selection.

Standard 3: Handling and Restraint (0137.S.3)
Students will demonstrate safe methods for handling and restraining farm animals.

Handling and Restraint Objectives
Students will:
0137.3.1 Identify and use tools related to handling and restraint of large animals.
0137.3.2 Demonstrate methods of techniques used in restraint of large animals.
0137.3.3 Utilize basic commands and animal behavior methods to control animals.
0137.3.4 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0137.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0137.4.1 Utilize safety practices in grooming and clipping large animals.
0137.4.2 Identify and utilize tools pertinent to the grooming, brushing and bathing of large animals.
0137.4.3 Demonstrate the ability to follow post-operative care and management of animals.

Standard 5: Anatomy and Physiology (0137.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:

0137.5.1 Identify the major parts and examine the functions of the skeletal system.
0137.5.2 Identify the major parts and examine the functions of the muscular system.
0137.5.3 Identify the major parts and examine the functions of the nervous system.
0137.5.4 Identify the major parts and examine the functions of the endocrine system.
0137.5.5 Identify the major parts and examine the functions of the respiratory system.
0137.5.6 Identify the major parts and examine the functions of the circulatory system.
0137.5.7 Identify the major parts and examine the functions of the reproductive system.
0137.5.8 Identify the major parts and examine the functions of the excretory system.
0137.5.9 Identify the major parts and examine the functions of the digestive system.
0137.5.10 Compare and contrast ruminant and monogastric systems.
0137.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0137.S.6)
Students will display a working knowledge of managing animal health.

Animal Health and Management Objectives
Students will:

0137.6.1 Determine the type of care and housing facilities needed for large animals.
0137.6.2 Examine mechanical injury and perform basic first aid requirements for large farm animals.
0137.6.3 Identify signs/symptoms of disease, as well as prevention and treatment of large animals.
0137.6.4 Utilize techniques in administering medicine and immunizing large farm animals.
0137.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies used with a large farm animal.
0137.6.6 Recognize relationships between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0137.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0137.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0137.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0137.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0137.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0137.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis of large animals.
0137.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic and field operations.
0137.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0137.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:

0137.8.1 Define, discuss and utilize terms associated with large animal nutrition.
0137.8.2 List and describe the basic nutrients and their functions.

0137.8.3 Analyze feed labels and determine the nutritional value of feeds and feedstuffs.
0137.8.4 Recognize signs of nutritional deficiencies.
0137.8.5 Analyze feeding and care requirements for maintaining pregnancy of large animals.

Standard 9: Marketing
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0137.9.1 Record data and complete information required by law and regulations in the management of large animals.
0137.9.2 Calculate and analyze cost of owning and operating a large animal health clinic.

Standard 10: Technology Applications (0137.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0137.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0137.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0137.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0137.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0137.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0137.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0137.11.2 Explore careers available in animal science.
0137.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0137.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0137.11.5 Demonstrate correct language usage in all oral and written work.
0137.11.6 Perform effectively in both leadership and non-leadership roles.
0137.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0137.11.8 Participate as a team member to complete a variety of assignments.

Animal And Veterinary Science – Small Animals

This agricultural science course is designed to give students a working knowledge of veterinary science through the study of many animals including dogs, cats, birds, reptiles and other pets. This course will provide an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of animals along with their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0138.S.1)
Students will become involved in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0138.1.1 Demonstrate an awareness of FFA and its components.
0138.1.2 Utilize record-keeping skills in work-based experience programs.
0138.1.3 Research appropriate career opportunities in veterinary medicine.
0138.1.4 Draft a resume, fill out a job application, demonstrate job seek/keep and computer skills.
0138.1.5 Develop and exhibit personal relation and communication skills.
0138.1.6 Demonstrate an awareness of employment and animal welfare ethics.

Standard 2: History and Selection of Small Animals (0138.S.2)
Students will examine the history and selection of small animals.

History and Selection of Small Animals Objectives
Students will:
0138.2.1 Trace the history of domestic animals and relate it to human and animal health.
0138.2.2 Classify small animals according to purposes/use.
0138.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0138.2.4 Examine the characteristics of small animals and incorporate into laboratory experimentation and disease evaluation.

Standard 3: Handling and Restraint (0138.S.3)
Students will demonstrate safe methods for handling and restraining small animals.

Handling and Restraint Objectives
Students will:
0138.3.1 Identify and use tools related to handling and restraint of small animals.
0138.3.2 Demonstrate methods and techniques used in restraint of small animals.
0138.3.3 Develop a basic understanding of animal behavior.
0138.3.4 Demonstrate the ability to follow post-operative care and management of animals.
0138.3.5 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0138.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0138.4.1 Utilize safety practices in grooming and clipping small animals.
0138.4.2 Identify and use animal grooming tools.
0138.4.3 Demonstrate an awareness of grooming practices (bathing, clipping, nail trimming, combing/brushing).
0138.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0138.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:
0138.5.1 Identify the major parts and examine the functions of the skeletal system.
0138.5.2 Identify the major parts and examine the functions of the muscular system.
0138.5.3 Identify the major parts and examine the functions of the nervous system.
0138.5.4 Identify the major parts and examine the functions of the endocrine system.
0138.5.5 Identify the major parts and examine the functions of the respiratory system.
0138.5.6 Identify the major parts and examine the functions of the circulatory system.
0138.5.7 Identify the major parts and examine the functions of the reproductive system.
0138.5.8 Identify the major parts and examine the functions of the excretory system.
0138.5.9 Identify the major parts and examine the functions of the digestive system.
0138.5.10 Compare and contrast ruminant and monogastric systems.
0138.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0138.S.6)
Students will describe the principles of managing animal health.

Animal Health and Management Objectives
Students will:
0138.6.1 Determine the type of care and housing facilities needed.
0138.6.2 Examine mechanical injury and perform basic first aid.
0138.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0138.6.4 Utilize techniques in administering medicine and immunizing.
0138.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies.
0138.6.6 Recognize relationship between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0138.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0138.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0138.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0138.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0138.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0138.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis.
0138.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic.
0138.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0138.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:
0138.8.1 Define, discuss and utilize terms associated with nutrition.

0138.8.2 List and describe the basic nutrients and their functions.
0138.8.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0138.8.4 Recognize signs of nutritional deficiencies.
0138.8.5 Analyze feeding and care requirements throughout life cycle and pregnancy.

Standard 9: Marketing (0138.S.9)
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0138.9.1 Research types of laws, regulations and licenses as needed in a veterinarian clinic.
0138.9.2 Calculate and analyze costs of owning and operating an animal care business.

Standard 10: Technology Applications (0138.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0138.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0138.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0138.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0138.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0138.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0138.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0138.11.2 Explore careers available in animal science.
0138.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0138.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0138.11.5 Demonstrate correct language usage in all oral and written work.
0138.11.6 Perform effectively in both leadership and non-leadership roles.
0138.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0138.11.8 Participate as a team member to complete a variety of assignments.

Animal Processing

This course is designed to provide students with basic knowledge and skills in meat processing occupations. Students will be able to exhibit these skills in the areas of sanitation and safety, slaughtering, processing and retailing, job seek/keep skills and microcomputer applications.

Standard 1: Leadership (0139.S.1)
Students will:

- demonstrate skills necessary to be employed.

Leadership Objectives
Students will:

0139.1.1 Participate in FFA activities.
0139.1.2 Write, deliver and evaluate a speech and/or oral presentation.
0139.1.3 Explore careers in processing.
0139.1.4 Determine appropriate job seek/keep skills.
0139.1.5 Demonstrate knowledge of ethical conduct in the workplace.

Standard 2: Sanitation/Safety (0139.S.2)
Students will:

- safely handle meat products.

Sanitation/Safety Objectives
Students will:

0139.2.1 List USDA sanitary practices relating to personal hygiene, sanitization of equipment and maintenance of facilities.
0139.2.2 Explain safe methods of handling tools, equipment and livestock in processing and slaughtering.
0139.2.3 Identify proper temperatures and time periods for storage and handling of fresh and frozen meat and meat products.
0139.2.4 Identify proper storage and handling techniques for consumables and by-products.

Standard 3: Slaughtering (0139.S.3)
Students will:

- demonstrate slaughtering procedures.

Slaughtering Objectives
Students will:

0139.3.1 List common breeds, USDA classes and grades of live cattle, sheep and swine.
0139.3.2 Demonstrate how to yield and quality grade hanging carcasses.
0139.3.3 Describe humane processes for stunning and bleeding animals.
0139.3.4 Properly skin, eviscerate and split carcasses of cattle.
0139.3.5 Skin or scald and scrape, eviscerate and split pork carcasses.
0139.3.6 Skin, fist and eviscerate lamb and mutton carcasses.
0139.3.7 Compute dressing percentage, percent shrink, return on offal and slaughter cost.
0139.3.8 Properly weigh and mark carcasses.

Standard 4: Processing (0139.S.4)
Students will:

- prepare retail meat products.

Processing Objectives
Students will:

0139.4.1 Identify primal cuts of beef, pork and lamb.
0139.4.2 Break carcasses into primal cuts.
0139.4.3 Identify retail cuts of beef, pork and lamb.
0139.4.4 Identify common boneless cuts of boxed beef and pork.
0139.4.5 Cut primal cuts and boxed products into various retail cuts.
0139.4.6 List methods of value added processing (grinding, curing, smoking, pre-cooking) and packaging of beef pork and lamb

Standard 5: Retailing (0139.S.5)
Students will:

- utilize merchandise product for customers.

Retailing Objectives
Students will:
0139.5.1 Prepare attractive displays of meat and meat products.
0139.5.2 Demonstrate knowledge and skills in customer relations.
0139.5.3 Exhibit an understanding of retail value; trim loss, shelf life and seasonal demand as related to pricing of products.

Standard 6: Technology Applications (0139.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0139.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal processing.
- Locate, evaluate, and collect information from a variety of sources related to animal processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0139.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0139.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal processing.
0139.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal processing.

Standard 7: Process/Workplace Skills (0139.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0139.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0139.7.2 Explore careers available in animal processing.
0139.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0139.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0139.7.5 Demonstrate correct language usage in all oral and written work.
0139.7.6 Perform effectively in both leadership and non-leadership roles.

0139.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0139.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0139.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0139.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0139.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0139.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0139.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Animal Science And Production

This agriculture science course is designed to give students a working knowledge of the commercial livestock industry, which includes beef, sheep, swine, horses, goats, dairy and poultry. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection, and economic and marketing principles related to employment. Students will develop a working knowledge of land use and livestock production to maintain an economical level of production. Upon completion of this course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0140.S.1)
Students will develop leadership skills.

Leadership Objectives
Students will:
0140.1.1 Describe FFA and its components.
0140.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0140.1.3 Identify careers in the animal industry.
0140.1.4 Identify employability skills.
0140.1.5 Develop personal relation and communication skills.
0140.1.6 Describe employment and animal welfare ethics.

Standard 2: History and Selection of Animals (0140.S.2)
Students will provide background information and describe characteristics of animals.

History and Selection of Animals Objectives
Students will:
0140.2.1 Relate the history of domestic animals to modern animal production.
0140.2.2 Describe and classify small animals according to purpose/use.
0140.2.3 Identify breeds of animals.
0140.2.4 Relate the characteristics of breeds to methods of selection (beef, sheep, swine, horses, goats, dairy and poultry).

Standard 3: Handling and Restraint (0140.S.3)
Students will demonstrate safe handling and restraining techniques.

Handling and Restraint Objectives
Students will:
0140.3.1 Identify and use tools related to handling/restraint of animals.
0140.3.2 Identify methods and techniques used in modern husbandry practices.
0140.3.3 Describe techniques in grooming and showing livestock.
0140.3.4 Describe safety practices for managing and handling livestock.

Standard 4: Animal Health and Management (0140.S.4)
Students will demonstrate animal health and management skills.

Animal Health and Management Objectives
Students will:
0140.4.1 Determine the type of care and housing facilities needed for livestock.
0140.4.2 Describe mechanical injury and treatment requirements.
0140.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0140.4.4 Utilize techniques in administering medicine and immunizing.
0140.4.5 Design and utilize a herd health program in livestock production.

Standard 5: Anatomy and Physiology (0140.S.5)
Students will utilize the fundamentals of anatomy and physiology in the commercial production of livestock.

Anatomy and Physiology Objectives
Students will:

0140.5.1 Identify the major parts and functions of the anatomy of various types of livestock.
0140.5.2 Identify the major parts and functions of the digestive system.
0140.5.3 Identify the major parts and functions of the reproductive system.
0140.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to livestock management.
0140.5.5 Identify and explain modern livestock breeding techniques.
0140.5.6 Analyze and explain data utilizing genotypic information to form a superior livestock program.

Standard 6: Nutrition (0140.S.6)
Students will describe the role of nutrition in animal production.

Nutrition Objectives
Students will:

0140.6.1 Define terms associated with nutrition.
0140.6.2 List and describe the basic nutrients and their functions.
0140.6.3 Balance rations and determine the nutritional value of feeds and feedstuffs.
0140.6.4 Identify signs of nutritional deficiencies.
0140.6.5 Identify feeding and care requirements throughout life cycle and pregnancy of livestock.
0140.6.6 Identify and design various forage management programs for economical livestock production

Standard 7: Marketing (0140.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:

0140.7.1 Research and study various livestock marketing techniques.
0140.7.2 Identify transportation and safety methods for livestock handling.
0140.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0140.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Technology Applications (0140.S.8)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0140.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science and production.
- Locate, evaluate, and collect information from a variety of sources related to animal science and production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0140.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0140.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal science and production.
0140.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science and production.

Standard 9: Process/Workplace Skills (0140.S.9)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0140.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0140.9.2 Explore careers available in animal science.
0140.9.3 Use a variety of sources to investigate the educational requirements of various careers in animal and science production.
0140.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0140.9.5 Demonstrate correct language usage in all oral and written work.
0140.9.6 Perform effectively in both leadership and non-leadership roles.
0140.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0140.9.8 Participate as a team member to complete a variety of assignments.

Standard 10: Laboratory Investigation (0140.10)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0140.10.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0140.10.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0140.10.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0140.10.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Aquaculture

This course of study is designed to provide experiential knowledge, skills and entrepreneurial competencies needed to enter various occupations in aquaculture and other scientific fields within aquaculture. This course integrates curricula of biology, physics, earth science and chemistry in producing aquatic species.

Standard 1: Orientation to the Aquaculture Industry (0141.S.1)
Students will examine the role of aquaculture in state, national and international economies.

Aquaculture Industry Objectives
Students will:
0141.1.1 Explore the role of aquaculture in the past, present and future.
0141.1.2 Relate the importance of aquaculture to state, national, and international economies.
0141.1.3 Examine employment trends and cycles related to aquaculture.

Standard 2: Leadership Development in Aquaculture (0141.S.2)
Students will participate in activities to develop leadership in the aquaculture industry.

Leadership Development in Aquaculture Objectives
Students will:
0141.2.1 Present prepared and extemporaneous speeches on issues concerning the aquaculture industry.
0141.2.2 Participate in community service.
0141.2.3 Demonstrate problem solving and decision making skills.
0141.2.4 Conduct meetings using parliamentary law.

Standard 3: Production Systems in Aquaculture (0141.S.3)
Students will design, establish and maintain aquaculture systems.

Production Systems in Aquaculture Objectives
Students will:
0141.3.1 Identify components of an aquaculture system and calculate water volumes, flow rates, solubility, density, etc.
0141.3.2 Research appropriate species for closed and flow-through systems.
0141.3.3 Explain basic animal management requirements for warm and cold-water species.
0141.3.4 Investigate and discuss factors that influence site selection.
0141.3.5 Using a bill of materials, design and/or construct a closed system.

Standard 4: Developing Work-based Experiential Programs (Supervised Agricultural Experience Programs) in Aquaculture (0141.S.4)
Students will explore entrepreneurial and employment opportunities in aquaculture.

Aquaculture Objectives
Students will:
0141.4.1 Define and explain the different supervised experience programs that are available in aquaculture.
0141.4.2 Prepare a business plan for implementation.
0141.4.3 Explore careers associated within the aquaculture industry.
0141.4.4 Create and demonstrate the key aspects of a marketing plan.
0141.4.5 Demonstrate different ways a fish can be processed.

Standard 5: Anatomy and Physiology (0141.S.5)
Students will identify and explain functions and disorders of body systems in aquatic species.

Anatomy and Physiology Objectives
Students will:
0141.5.1 Identify and explain the functions of body systems in aquatic species.
0141.5.2 Explain the process of spawning.
0141.5.3 Distinguish common fish health problems in closed systems.
0141.5.4 Investigate the role of breeding and selection in genetic improvement.

Standard 6: Nutrition (0141.S.6)
Students will describe nutrition affecting aquatic species.

Nutrition Objectives
Students will:
0141.6.1 Identify and compare common types of feed.
0141.6.2 Calculate feed rates.
0141.6.3 Calculate feed conversion.
0141.6.4 Calculate feed efficiency.
0141.6.5 Describe the nutritional needs of fish at different stages of growth.

Standard 7: Water Chemistry and its Relationship to Aquaculture (0141.S.7)
Students will perform water quality procedures and rebate results to performance of aquatic species.

Water Chemistry Objectives
Students will:
0141.7.1 Explain water quality parameters.- pH, Oxygen level, nitrates, nitrates, etc.
0141.7.2 Demonstrate sampling and testing techniques.
0141.7.3 Design a wastewater management system.

Standard 8: Safety in Aquaculture Laboratories (0141.S.8)
Students will demonstrate principles of safety in aquaculture.

Aquaculture Laboratories Objectives
Students will:
0141.8.1 Maintain a safe working environment in the aquaculture laboratory.
0141.8.2 Demonstrate and apply laboratory safety in aquaculture settings.

Standard 9: Laboratory Practices and Procedures/Hands-on Learning (0141.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Practices and Procedures Objectives
Students will:
0141.9.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0141.9.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0141.9.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0141.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 10: Technology Applications in Aquaculture (0141.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications in Aquaculture Objectives
Students will:

0141.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in aquaculture.
- Locate, evaluate, and collect information from a variety of sources related to aquaculture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0141.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.

0141.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to aquaculture.

0141.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of aquaculture.

Standard 10: Process/workplace Skills and Aquaculture (0141.S.10)
Students will demonstrate personal and group workplace skills.

Workplace Skills Objectives
Students will:

0141.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0141.11.2 Explore careers available in aquaculture.

0141.11.3 Use a variety of sources to investigate the educational requirements of various careers in aquaculture and related sciences.

0141.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0141.11.5 Demonstrate correct language usage in all oral and written work.

0141.11.6 Perform effectively in both leadership and non-leadership roles.

0141.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0141.11.8 Participate as a team member to complete a variety of assignments.

Computers In Agriculture

This course is designed to expose students to computer programming, software and applications and graphical and electronic information technology as it relates to the agriculture industry. Students will be able to utilize computers and related technology in desktop publishing, record-keeping, agricultural production, agribusiness and telecommunications. Students will also relate these applications to potential occupations within the computer technology field.

Standard 1: Word Processing and Communications (0142.S.1)
Students will demonstrate skills involving word processing in agriculture.

Word Processing and Communications Objectives
Students will:
0142.1.1 Prepare documents using word processing software.
0142.1.2 Utilize keyboarding skills for preparing reports and letters.
0142.1.3 Improve writing skills through the use of grammatical aids.
0142.1.4 Utilize data management systems.

Standard 2: Spreadsheet Applications (0142.S.2)
Students will use agricultural data in computer-based spreadsheets.

Spreadsheet Applications Objectives
Students will:
0142.2.1 Use software programs to integrate mathematical functions into agricultural production and agribusiness systems.
0142.2.2 Manipulate numerical data as it relates to cost benefit analysis.
0142.2.3 Prepare budgets, financial statements, income reports and production records.
0142.2.4 Complete applications relating to work-based experiences (Supervised Agricultural Experience Programs).

Standard 3: Graphical Presentations (0142.S.3)
Students will utilize graphical presentation software.

Graphical Presentations Objectives
Students will:
0142.3.1 Utilize graphic based software for presentations.
0142.3.2 Prepare visual aids for communicative demonstrations.

Standard 4: Electronic Information Systems (0142.S.4)
Students will demonstrate skills involving electronic information systems.

Electronic Information Systems Objectives
Students will:
0142.4.1 Utilize telecommunications resources in writing documents, manipulating data and transmitting information.
0142.4.2 Retrieve data from agricultural networks.
0142.4.3 Investigate product-marketing principles using computer technology.
0142.4.4 Integrate computer technology into agricultural production systems through the use of remote control and remote sensor science.
0142.4.5 Explore Global Positioning Satellite applications in agriculture.

Standard 5: Agricultural Journalism and Desktop Publishing (0142.S.5)
Students will produce agricultural publications.

Agricultural Journalism and Desktop Publishing Objectives
Students will:

0142.5.1 Prepare newspaper and magazine articles for publishing.
0142.5.2 Manufacture flyers, programs and booklets using graphic software.
0142.5.3 Design a template for printing books, articles and programs.

Standard 6: Process/Workplace Skills (0142.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0142.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0142.6.2 Explore careers available in computer technology.
0142.6.3 Use a variety of sources to investigate the educational requirements of various careers in computer technology.
0142.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0142.6.5 Demonstrate correct language usage in all oral and written work.
0142.6.7 Perform effectively in both leadership and non-leadership roles.
0142.6.8 Evaluate information for reliability, completeness, and applicability to various assignments.
0142.6.9 Participate as a team member to complete a variety of assignments.

Environmental Technology

This class will cover various aspects of environmental science applications to prevent detrimental effects on our ecosystem. Units will include solid and hazardous waste, water purification, wastewater treatment, solid erosion control, nutrient management and environmental surveying.

Standard 1: Solid Waste (0143.S.1)
Students will identify solid waste.

Solid Waste Objectives
Students will:
0143.1.1 Analyze sources of solid waste.
0143.1.2 Examine hazards in solid waste materials and disposal.
0143.1.3 Compare and contrast methods of solid waste disposal.
0143.1.4 Explain and participate in recycling.
0143.1.5 Describe composting.
0143.1.6 Explore methods and benefits of composting.

Standard 2: Hazardous Waste (0143.S.2)
Students will identify hazardous waste materials.

Hazardous Waste Objectives
Students will:
0143.2.1 Identify types of hazardous waste.
0143.2.2 Describe ecotoxicology.
0143.2.3 Explain hazardous waste disposal.
0143.2.4 Explain safety procedures and simulate clean up of spills.

Standard 3: Water Purification (0143.S.3)
Students will identify water purification.

Water Purification Objectives
Students will:
0143.3.1 Describe the composition of water.
0143.3.2 Explain the importance of water.
0143.3.3 Identify sources of water.
0143.3.4 Investigate and discuss how water is stored and distributed.
0143.3.5 Research how water is used and managed.
0143.3.6 Name and distinguish various types of wetlands.
0143.3.7 Explore the benefits and function of wetlands.
0143.3.8 Analyze how human action affects wetlands.

Standard 4: Wastewater Treatment and Disposal (0143.S.4)
Students will identify wastewater treatments and disposals.

Wastewater Treatment and Disposal Objectives
Students will:
0143.4.1 Identify sources of wastewater.
0143.4.2 Describe hazards in wastewater.
0143.4.3 Compare and contrast ways of treating wastewater.
0143.4.4 Research the products of wastewater treatment, including the production and use of biosolids.
0143.4.5 Recognize and investigate the important biological, chemical, and biogeochemical processes in wastewater treatment.

0143.4.6 Explain the components and operation of a wastewater treatment system.

Standard 5: Soil Erosion Control (0143.S.5)
Students will identify soil erosion.

Soil Erosion Control Objectives
Students will:
0143.5.1 Identify and describe the physical properties of soil and their impact on soil erosion.
0143.5.2 Compare and contrast types of soil erosion.
0143.5.3 Illustrate soil conservation practices for urban and agricultural areas.
0143.5.4 Utilize a soil survey to make environmental decisions.
0143.5.5 Explain the best management practices to control sediment from urban areas, agriculture and forests.
0143.5.6 Examine soil erosion control devices.

Standard 6: Nutrition Management (0143.S.6)
Students will identify nutritional management of soil.

Nutrition Management Objectives
Students will:
0143.6.1 Investigate and discuss non-point source pollution.
0143.6.2 Utilize soil nutrient testing procedures to determine available nutrients.
0143.6.3 Utilize nutrient testing procedures to determine organic matter content.
0143.6.4 Complete a nutrient management plan.
0143.6.5 Calibrate a nutrient spreader for rate of application.
0143.6.6 Perform water-testing procedures and interpret results to determine impacts of non-point source pollution.

Standard 7: Environmental Surveying (0143.S.7)
Students will identify the trade of environmental surveying.

Environmental Surveying Objectives
Students will:
0143.7.1 Demonstrate basic surveying skills.
0143.7.2 Utilize topographical maps to make environmental decisions.
0143.7.3 Apply design principles to pond and wetland construction, sediment basins, and other similar structures.
0143.7.4 Identify and accurately utilize surveying equipment.

Standard 8: Leadership (0143.S.8)
Students will participate in related activities.

Leadership Objectives
Students will:
0143.8.1 Participate in WV Envirothon and other activities related to the curriculum.
0143.8.2 Utilize Internet World Wide Net to explore specialty areas in horticulture.

Standard 9: Laboratory Investigation (0143.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0143.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0143.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0143.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0143.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0143.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0143.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in environmental technology.
- Locate, evaluate, and collect information from a variety of sources related to environmental technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0143.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0143.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to environmental technology.
0143.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of environmental technology.

Standard 11: Process/Workplace Skills (0143.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0143.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0143.11.2 Explore careers available in environmental technology.
0143.11.3 Use a variety of sources to investigate the educational requirements of various careers in environmental technology.
0143.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0143.11.5 Demonstrate correct language usage in all oral and written work.
0143.11.6 Perform effectively in both leadership and non-leadership roles.
0143.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0143.11.8 Participate as a team member to complete a variety of assignments.

Food Science and Processing

This course is designed to provide students with knowledge, skills and competencies needed to enter various food science and food products processing careers. Major concepts covered are leadership, nutrition, food safety, and food products processing and marketing of food products.

Standard 1: Leadership (0144.S.1)
Students will demonstrate leadership skills.

Leadership Objectives
Students will:
0144.1.1 List food science and food products processing related careers.
0144.1.2 Participate in FFA activities.
0144.1.3 Complete a Supervised Agricultural Experience (SAE) Program.
0144.1.4 Present individual and group presentations on food products processing related topics.
0144.1.5 Conduct meetings using parliamentary law.

Standard 2: Nutrition (0144.S.2)
Students will explain basics of good nutrition and good health.

Nutrition Objectives
Students will:
0144.2.1 Identify six basic nutrients and related nutrient deficiencies.
0144.2.2 Read and interpret information on product labels.
0144.2.3 Demonstrate knowledge of food groups by classifying foods accordingly.
0144.2.4 Explain procedures involved in enhancing the nutritional value of food.
0144.2.5 Relate retail cost and nutritional value of food palatability.
0144.2.6 Demonstrate an awareness of the effects of food on physical health and well being.

Standard 3: Food Safety (0144.S.3)
Students will describe factors affecting food safety.

Food Safety Objectives
Students will:
0144.3.1 Identify common risks and safety hazards involved in storage, handling, processing and preparation of food products.
0144.3.2 Understand the influence of potable water on processing, storing and packaging food.
0144.3.3 Describe the effects of microbes on food spoilage during processing, handling, storage and food preparation.
0144.3.4 Describe FSIS and USDA inspection and grading standards relating to food products.
0144.3.5 Relate the importance of product testing to providing a safe and wholesome food supply (including drugs/hormones, pesticides and consumer quality issues.)

Standard 4: Food Products Processing (0144.S.4)
Students will explore different techniques of processing foods.

Food Products Processing Objectives
Students will:
0144.4.1 Analyze the effects of food processing techniques on the nutritional value of foods.
0144.4.2 Demonstrate food-processing techniques used in the dairy products industry. (fermentation, pasteurization and homogenization).
0144.4.3 Describe techniques used in cereal grain processing. (bleaching, grinding, milling and enriching).

0144.4.4 List processing techniques used in the meat industry. (cooking, curing, grinding).
0144.4.5 Demonstrate an awareness of food processing techniques used in the fruit and vegetable industry (canning, freezing, heating.)
0144.4.6 Dehydrate food items to produce less perishable products.
0144.4.7 Describe and demonstrate food preservation techniques.
0144.4.8 Identify bioengineered food items and describe microbiological processing techniques.

Standard 5: Marketing (0144.S.5)
Students will explore factors that influence food cost and consumption trends.

Marketing Objectives
Students will:
0144.5.1 Describe the relative cost of food in the U.S. as compared to other counties.
0144.5.2 Identify trends and cycles in food product markets.
0144.5.3 Relate pricing of products to trends and cycles in markets.
0144.5.4 Demonstrate an awareness of different packaging techniques and their effects on product quality.
0144.5.5 List transportation methods used in marketing products.

Standard 6: Technology Applications (0144.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0144.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in food science and processing.
- Locate, evaluate, and collect information from a variety of sources related to food science and processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0144.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0144.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to food science and processing.
0144.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of food science and processing.

Standard 7: Process/Workplace Skills (0144.S.7)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0144.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0144.7.2 Explore careers available in food science and processing.
0144.7.3 Use a variety of sources to investigate the educational requirements of various careers in food science.
0144.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0144.7.5 Demonstrate correct language usage in all oral and written work.
0144.7.6 Perform effectively in both leadership and non-leadership roles.
0144.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0144.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0144.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0144.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0144.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0144.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0144.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Hydroponics

This course emphasizes the scientific method in the production of hydroponic plants. The curriculum provides problem solving experiences and skills in plant propagation, plant growth and development in a soilless media.

Standard 1: Orientation to Hydroponics and Industry (0145.S.1)
Students will explore hydroponics technique and identify the progress in the industry.

Hydroponics and Industry Objectives
Students will:
0145.1.1 Describe the history and development of hydroponic growing techniques.
0145.1.2 Identify advantages and constraints of hydroponics.
0145.1.3 Compare and contrast traditional growing methods to soilless culture.

Standard 2: Classification of Hydroponic Plant Production System (0145.S.2)
Students will recognize the diversity of hydroponic systems and media.

Classification Objectives
Students will:
0145.2.1 Describe the difference between open and closed plant production system.
0145.2.2 Identify types and characteristics of soilless media.
0145.2.3 Describe solution, culture methods and nutrient film technique.

Standard 3: Plant Growth and Development (0145.S.3)
Students will describe plant structures and environmental requirements for plant growth.

Plant Growth and Development Objectives
Students will:
0145.3.1 Identify plant structures and functions.
0145.3.2 Describe environmental requirements for plant growth.

Standard 4: Leadership and Interpersonal Skill Development (0145.S.4)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0145.4.1 Serve as a small group team leader.
0145.4.2 Identify leadership and decision making skills.
0145.4.3 Participate in committee and leadership development activities.
0145.4.4 Conduct community and school improvement projects.

Standard 5: Developing Work-Based Experiential Programs (0145.S.5)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0145.5.1 Determine areas and careers of major interest in agriculture.
0145.5.2 Manage school-based hydroponics laboratory enterprises.
0145.5.3 Establish experience program record book procedures.

Standard 6: Laboratory Safety Skills (0145.S.6)
Students will practice and demonstrate safety in the laboratory.

Safety Skills Objectives
Students will:
0145.6.1 Establish a safe working environment.
0145.6.2 Identify safety polices and procedures.
0145.6.3 Demonstrate proper use of equipment.

Standard 7: Computer Applications in Hydroponics and Plant Science (0145.S.7)
Students will apply technology to investigate real-world problems.

Computer Applications Objectives
Students will:
0145.7.1 Use Internet for research applications in hydroponics.
0145.7.2 Identify how computer based systems may be used for hydroponics environmental control.
0145.7.3 Utilize keyboarding and word processing skills to prepare class reports.

Standard 8: Greenhouse Structures (0145.S.8)
Students will recognize environmental components for structure construction and operation.

Greenhouse Structures Objectives
Students will:
0145.8.1 Identify environmental controls (heating and cooling components) of a greenhouse.
0145.8.2 Explain the function of greenhouse structure components.
0145.8.3 Determine the appropriate site and location of a hydroponics greenhouse.

Standard 9: Producing Hydroponic Crops (0145.S.9)
Students will determine appropriate amendments and identify effective procedures for hydroponic crop management.

Hydroponic Crops Objectives
Students will:
0145.9.1 List requirements of hydroponic tomatoes and lettuce production systems.
0145.9.2 Identify other plants that may be produced hydroponically.
0145.9.3 Test, interpret and manage pH.
0145.9.4 Measure electrical conduction of nutrient solution.
0145.9.5 Mix and manage hydroponic solutions.
0145.9.6 Determine methods of biological insect control.
0145.9.7 Identify mineral deficiencies.

Leadership Development

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships.

Standard 1: Leadership Styles (0146.S.1)
Students will describe various leadership styles.

Leadership Styles Objectives
Students will:
0146.1.1 Define leadership.
0146.1.2 Explain traits and styles.
0146.1.3 Explore different personality traits.
0146.1.4 Recognize informal leader.

Standard 2: Developing Formal Leadership Methods (0146.S.2)
Students will explain leadership methods.

Formal Leadership Objectives
Students will:
0146.2.1 Describe duties of officers in an organization.
0146.2.2 Define all different forms of motions.
0146.2.3 Identify proper conduct for meetings.

Standard 3: Public Speaking (0146.S.3)
Students will acquire skills in public speaking.

Public Speaking Objectives
Students will:
0146.3.1 Present two required speeches.
0146.3.2 Prepare an introduction for invited guest speakers.
0146.3.3 Observe invited quest speakers for different speaking styles.
0146.3.4 Become involved in a controlled debate.
0146.3.5 Conduct small group discussions on current events.

Standard 4: Community Service (0146.S.4)
Students will develop skills to participate in community service.

Community Service Objectives
Students will:
0146.4.1 Conduct community projects. Depending on the community the class can do many different projects with the Chamber of Commerce, Rotary, United Way, etc.
0146.4.2 Conduct school improvement projects. Work with the student council in developing projects that will improve the school grounds, buildings, etc.
0146.4.3 Conduct projects that deal with drug awareness, drinking and driving, etc.

Standard 5: Goal Setting (0146.S.5)
Students will use goal setting, time management and stress management.

Goal Setting Objectives
Students will:
0146.5.1 Explore goal setting (long term and short term).

0146.5.2 Describe methods of time management.
0146.5.3 Identify stress reduction methods.

Standard 6: Job Seeking Skills (0146.S.6)
Students will develop job-seeking skills.

Job Seeking Skills Objectives
Students will:
0146.6.1 Explore areas of proper dress in the work place.
0146.6.2 Prepare a cover letter and resume.
0146.6.3 Describe proper interview techniques for an oral interview.

Standard 7: Interpersonal Relations (0146.S.7)
Students will demonstrate interpersonal relationships for job success.

Interpersonal Relations Objectives
Students will:
0146.7.1 Explain and discuss a paradigm shift.
0146.7.2 Write thank you letters to the teachers before graduation.
0146.7.3 Explore conflict resolution.
0146.7.4 Hold mock social gathering with adults.
0146.7.5 Explore proper ethics and values.

Standard 8: Technology Application (0146.S.8)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0146.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in leadership development.
- Locate, evaluate, and collect information from a variety of sources related to leadership development.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0146.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0146.8.3 Use TV/Satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to leadership development.
0146.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of leadership development.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Leadership Development (0147.S.1)
Students will participate in activities to promote leadership development.

Leadership Development Objectives
Students will:
0147.1.1 Identify the year FFA was formed.
0147.1.2 Name the author of the creed.
0147.1.3 Identify the location of the state and national convention.
0147.1.4 Name the state and national FFA advisors.
0147.1.5 Name the degree levels in FFA.
0147.1.6 Identify parts of the emblem.
0147.1.7 Present a speech on outdoor recreation.

Standard 2: Career Development (0147.S.2)
Students will research career development in outdoor recreation.

Career Development Objectives
Students will:
0147.2.1 Identify regional career opportunities in outdoor recreation including. Park Ranger, Recreation Manager, Instructor, Conservation Officer, First Aid/Safety Expert, Entertainment Manager, Business Manager, Outdoor Guide, Youth Camp Operator, Campground Owner, Riding Stable Owner and Lifeguard.
0147.2.2 Profile outdoor recreation specialists.
0147.2.3 Develop teamwork skills and activities.
0147.2.4 Develop public relation skills.

Standard 3: Outdoor Safety (0147.S.3)
Students will participate in activities to promote outdoor safety.

Outdoor Safety Objectives
Students will:
0147.3.1 Obtain Red Cross first aid certificate.
0147.3.2 Obtain Red Cross adult CPR certificate.
0147.3.3 Identify potential outdoor safety hazards.
0147.3.4 Identify poisonous plants.
0147.3.5 Identify poisonous insects.
0147.3.6 Identify poisonous animals.
0147.3.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 4: Natural Resource and Recreation (0147.S.4)
Students will identify natural resource and recreation areas.

Natural Resource and Recreation Objectives
Students will:
0147.4.1 Describe geological formations.
0147.4.2 Recognize services required for recreational areas.
0147.4.3 Recognize facilities required for recreational areas.

0147.4.4 Identify endangered species of plants and animals.
0147.4.5 Identify wetlands and riparian zones.
0147.4.6 Describe local, state and federal laws related to recreational enterprises.

Standard 5: Business Opportunities and Promotions (0147.S.5)
Students will recognize business opportunities and promotions.

Business Opportunities and Promotions Objectives
Students will:
0147.5.1 Recognize income potential from various types of recreational enterprises.
0147.5.2 Identify business procedures required of recreational enterprises.
0147.5.3 Design advertising media to promote a recreational area effectively.

Standard 6: Laboratory Investigation (0147.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0147.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0147.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0147.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0147.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Application (0147.S.7)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0147.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in outdoor recreation.
- Locate, evaluate, and collect information from a variety of sources related to outdoor recreation.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0147.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0147.7.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 8: Process/Work Place Skills (0147.S.8)
Students will demonstrate personal and group workplace skills.

Process/Work Place Skills Objectives
Students will:
0147.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0147.8.2 Explore careers available in outdoor recreation.
0147.8.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
0147.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0147.8.5 Demonstrate correct language usage in all oral and written work.
0147.8.6 Perform effectively in both leadership and non-leadership roles.
0147.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0147.8.8 Participate as a team member to complete a variety of assignments.

Poultry Science and Production

This agricultural science course is designed to give students a working knowledge of the poultry industry, which includes chickens, turkeys and other avian species. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection and economic and marketing principles related to employment. Students will develop a working knowledge of land use and poultry production to maintain an economical level of production. Upon completion course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Orientation to the Poultry Industry (0148.S.1)
Students will explore different facets of the poultry industry.

Poultry Industry Objectives
Students will:
0148.1.1 Describe the importance of the poultry industry to the state and national economy.
0148.1.2 Identify different types of poultry enterprises.
0148.1.3 Relate consumption trends in poultry products.
0148.1.4 Identify and analyze career opportunities in the poultry industry.

Standard 2: Selection for Production (0148.S.2)
Students will use industry standards for poultry selection.

Selection for Production Objectives
Students will:
0148.2.1 List the classes of poultry and identify common breeds.
0148.2.2 Describe characteristics of birds that relate to productivity.
0148.2.3 Explain criteria to consider in selecting a breed for various types of production.
0148.2.4 Describe factors that influence chick purchase decisions.
0148.2.5 Describe characteristics associated with high egg production and procedures used in culling.
0148.2.6 Describe selection characteristics of parent and grandparent seed stock lines.

Standard 3: Nutrition and Management (0148.S.3)
Students will study factors that affect profitability.

Nutrition and Management Objectives
Students will:
0148.3.1 Describe factors that affect cost of poultry and egg production.
0148.3.2 Determine facility and equipment requirements for various poultry enterprises.
0148.3.3 Formulate rations for laying flocks, turkeys and broilers.
0148.3.4 Describe methods of disease and parasite control.
0148.3.5 Explain environmentally friendly methods of litter and dead bird disposal.
0148.3.6 Use computer programs to maintain inventory, expenses, income and other pertinent records.

Standard 4: Poultry Health and Management (0148.S.4)
Students will recognize best management practices for flock health.

Poultry Health and Management Objectives
Students will:
0148.4.1 Determine the type of care and housing facilities needed for poultry.
0148.4.2 Identify mechanical injury and treatment requirements.
0148.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0148.4.4 Utilize techniques in administration of medicine and immunization.

0148.4.5 Design and utilize a flock health program in poultry production.

Standard 5: Anatomy and Physiology (0148.S.5)
Students will utilize the fundamentals of anatomy and physiology in the production of poultry.

Anatomy and Physiology Objectives
Students will:
0148.5.1 Identify the major parts and functions of the anatomy of various types of poultry.
0148.5.2 Identify the major parts and functions of the digestive system.
0148.5.3 Identify the major parts and functions of the reproductive system.
0148.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to poultry management.
0148.5.5 Identify and explain modern poultry breeding techniques.
0148.5.6 Analyze and explain data utilizing genotypic information to form a superior poultry program.

Standard 6: Solid Waste (0148.S.6)
Students will explore strategies for handling poultry waste.

Solid Waste Objectives
Students will:
0148.6.1 Describe sources of solid waste associated with poultry industries.
0148.6.2 Explain hazards in solid waste materials and disposal.
0148.6.3 Describe ways of disposing of solid waste.
0148.6.4 Identify NRCS and SCS programs available for assistance in litter disposal.
0148.6.5 Explain recycling.
0148.6.6 Describe composting.
0148.6.7 Identify methods and benefits of composting.

Standard 7: Marketing (0148.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:
0148.7.1 Research and study various livestock marketing techniques.
0148.7.2 Identify transportation and safety methods for livestock handling.
0148.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0148.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Leadership and Communication (0148.S.8)
Students will demonstrate leadership in the poultry industry.

Leadership and Communication Objectives
Students will:
0148.8.1 Present written and oral reasons in poultry judging events.
0148.8.2 Participate in FFA meetings and activities.
0148.8.3 Prepare and present speeches on issues involving the poultry industry using information available from magazines, trade journals, the Internet and other sources.

Standard 9: Technology Applications (0148.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0148.9.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in poultry production.
- Locate, evaluate, and collect information from a variety of sources related to poultry production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0148.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0148.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to poultry production.

0148.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of poultry production.

Standard 10: Process/Workplace Skills in Agribusiness (0148.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:

0148.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0148.10.2 Explore careers available in agribusiness.

0148.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.

0148.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0148.10.5 Demonstrate correct language usage in all oral and written work.

0148.10.6 Perform effectively in both leadership and non-leadership roles.

0148.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0148.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Lab Investigation (0148.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Lab Investigation Objectives
Students will:

0148.11.1 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0148.11.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0148.11.3 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

0148.11.4 Conduct a supervised agricultural experience program with appropriate records.

Small Animal Care and Management

This course is designed to give students a working knowledge of the small animal care industry, which includes dogs, cats, birds, reptiles and other pets. The course provides an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of small animals, their management and a keen business sense relating to small animals. Upon completion of this course, students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0149.S.1)
Students will demonstrate leadership skills for success in the small animal industry.

Leadership Objectives
Students will:
0149.1.1 Identify FFA and it's components.
0149.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0149.1.3 Identify appropriate career opportunities in the small animal care industry.
0149.1.4 Draft a resume, fill out a job application, and demonstrate job seek/keep skills.
0149.1.5 Develop personal relation and communication skills.
0149.1.6 Identify animal welfare ethics and other issues.
0149.1.7 Develop a working relationship with local veterinarians.

Standard 2: History and Selection of Animals (0149.S.2)
Students will provide background information and describe the desirable characteristics of domestic animals.

Animals Objectives
Students will:
0149.2.1 Relate the history of domestic animals to modern animal production.
0149.2.2 Describe and classify small animals according to purposes/uses.
0149.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0149.2.4 Relate the characteristics of breeds to methods of selection.
0149.2.5 Be able to differentiate between domestic and exotic animals.

Standard 3: Training, Handling and Restraint (0149.S.3)
Students will demonstrate safe handling and restraining techniques.

Training, Handling and Restraint Objectives
Students will:
0149.3.1 Identify and use tools related to training and handling/restraint of small animals.
0149.3.2 Identify methods and techniques used in restraint and training of small animals.
0149.3.3 Utilize basic commands and training methods.
0149.3.4 Identify AKC guidelines for instructing dogs.
0149.3.5 Utilize safety practices in training and handling.

Standard 4: Grooming and Clipping (0149.S.4)
Students will demonstrate skills in grooming and clipping.

Grooming and Clipping Objectives
Students will:
0149.4.1 Utilize safety practices in grooming and clipping small animals.
0149.4.2 Identify tools used in grooming.
0149.4.3 Describe grooming practices (bathing, clipping, nail trimming, combing/brushing).
0149.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0149.S.5)
Students will utilize the fundamentals of anatomy and physiology in caring for small animals.

Anatomy and Physiology Objectives
Students will:
0149.5.1 Identify the major parts and functions of the skeletal system.
0149.5.2 Identify the major parts and functions of the muscular system.
0149.5.3 Identify the major parts and functions of the nervous system.
0149.5.4 Identify the major parts and functions of the endocrine system.
0149.5.5 Identify the major parts and functions of the respiratory system.
0149.5.6 Identify the major parts and functions of the circulatory system.
0149.5.7 Identify the major parts and functions of the reproductive system.
0149.5.8 Identify the major parts and functions of the excretory system.
0149.5.9 Identify the major parts and functions of the digestive system.
0149.5.10 Explain the difference between ruminant and monogastric systems.
0149.5.11 Describe functions of other small animals systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0149.S.6)
Students will demonstrate competencies in animal health and management.

Animal Health and Management Objectives
Students will:
0149.6.1 Determine the type of care and housing facilities needed.
0149.6.2 Identify mechanical injury and basic first aid requirements.
0149.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0149.6.4 Utilize techniques in administering medicine and immunizing.

Standard 7: Nutrition (0149.S.7)
Students will describe the role of nutrition in small animal care.

Nutrition Objectives
Students will:
0149.7.1 Define terms associated with nutrition.
0149.7.2 List and describe the basic nutrients and their functions.
0149.7.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0149.7.4 Identify signs of nutritional deficiencies.
0149.7.5 Identify feeding and care requirements throughout life cycle and pregnancy.

Standard 8: Marketing (0149.S.8)
Students will demonstrate competencies in marketing small animals.

Marketing Objectives
Students will:
0149.8.1 Explore types of markets available.

0149.8.2 Identify transportation methods.
0149.8.3 Research types of laws, regulations and licenses needed in local area.
0149.8.4 Analyze costs of owning and operating a small animal care business.

Standard 9: Technology Applications (0149.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0149.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0149.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0149.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0149.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 10: Process/Workplace Skills in Agribusiness (0149.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:
0149.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0149.10.2 Explore careers available in agribusiness.
0149.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0149.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0149.10.5 Demonstrate correct language usage in all oral and written work.
0149.10.6 Perform effectively in both leadership and non-leadership roles.
0149.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0149.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Laboratory Investigation (0149.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0149.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0149.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0149.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0149.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Soil And Plant Science (Agronomy)

This area of study is designed to provide students with scientific knowledge and experiences essential to careers in soil and plant science. The course includes major units in soil formation, soil properties, land classification, fertility, plant growth and the impact of agriculture on the environment.

Standard 1: Orientation to Soil and Plant Science (0150.S.1)
Students will soil and plant science.

Soil and Plant Science Objectives
Students will:
0150.1.1 Research career opportunities in soil and plant science.
0150.1.2 Describe the impact of agriculture on the environment.
0150.1.3 List and describe the function of federal, state and local entities and interest groups concerned with soil and plant science.
0150.1.4 Examine the role of soil and plants in the ecosystem.

Standard 2: Leadership Development (0150.S.2)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0150.2.1 Participate in meetings using parliamentary law.
0150.2.2 Use interpersonal skills in team problem solving.
0150.2.3 Prepare and deliver a brief presentation on an agronomic topic.

Standard 3: Provide Work-Based Experiential Learning Opportunities (0150.S.3)
Students will participate in a work-base experience program.

Work-Based Objectives
Students will:
0150.3.1 Explore opportunities for work-based experience through supervised experience programs.
0150.3.2 Define record keeping terms for supervised experience programs.
0150.3.3 Develop budgets for potential supervised experience programs.

Standard 4: Soil Origin and Development (0150.S.4)
Students will identify how soil is formed and surveyed.

Soil Origin and Development Objectives
Students will:
0150.4.1 Determine how soil is formed.
0150.4.1 Interpret information from soil surveys.

Standard 5: Physical Properties of Soil (0150.S.5)
Students will identify the various physical properties of soil samples.

Soil Objectives
Students will:
0150.5.1 Define and determine soil depth.
0150.5.2 Define and determine soil texture.
0150.5.3 Define and determine soil structure.
0150.5.4 Define and determine soil permeability.

0150.5.5 Define and determine drainage.
0150.5.6 Define and determine slope.

Standard 6: Classification of Soils Into Soil Series and Land Capability Classes (0150.S.6)
Students will identify the various classification of soil.

Classification of Soils Objectives
Students will:
0150.6.1 Classify soils by common physical properties.
0150.6.2 Describe soil series of the region.
0150.6.3 Determine land capability classes and recommend appropriate land management practices.

Standard 7: Plant Nutrition and Soil Fertility (0150.S.7)
Students will identify the various functions of plant nutrition and soil fertility.

Plant Nutrition and Soil Fertility Objectives
Students will:
0150.7.1 List and describe the functions of macro and micronutrients.
0150.7.2 Describe and identify plant nutrient deficiencies.
0150.7.3 Explain the function and management of soil pH.
0150.7.4 Describe and engage in the process of soil testing.
0150.7.5 Interpret and apply data generated by soil testing.
0150.7.6 List and compare sources of plant nutrients.
0150.7.7 Identify nutrient deficiencies and plant diseases.
0150.7.8 Conduct plant growth experiments.
0150.7.9 Use soil-testing equipment.

Standard 8: Plant Structures and their Functions (0150.S.8)
Students will identify the various plant structures and their functions.

Plant Structures Objectives
Students will:
0150.8.1 Explain basic plant production requirements.
0150.8.2 Identify the major parts of a plant.
0150.8.3 Describe the function of the major parts of a plant.
0150.8.4 Demonstrate knowledge of plant growth processes photosynthesis, respiration and transpiration.

Standard 9: Row Crop Management (0150.S.9)
Students will identify the various methods to row crop management.

Row Crop Management Objectives
Students will:
0150.9.1 Identify row crops common to the area.
0150.9.2 Describe cultural requirements and production practices of row crops.
0150.9.3 List and describe harvesting methods.

Standard 10: Forage Management (0150.S.10)
Students will identify the various methods to row crop management.

Forest Management Objectives
Students will:
0150.10.1 Identify forage crops common to the area.
0150.10.2 Describe cultural requirements and production practices of forage crops.
0150.10.3 List and describe harvesting methods.

Standard 11: Soil and Water Conservation (0150.S.11)
Students will identify the various methods of soil and water conservation.

Soil and Water Conservation Objectives
Students will:
0150.11.1 Define and provide examples of erosion.
0150.11.2 Explain agricultural practices to conserve soil and reduce pollution (stewardship).
0150.11.3 Predict impacts of erosion.
0150.11.4 Identify and describe best management practices to prevent soil erosion.
0150.11.5 Utilize the World Wide Web to explore specialty areas in soil and plant science.

Standard 12: Laboratory Investigation (0150.S.12)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0150.12.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0150.12.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0150.12.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0150.12.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 13: Technology Applications (0150.S.13)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0150.13.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in soil and plant science.
- Locate, evaluate, and collect information from a variety of sources related to soil and plat science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0150.13.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0150.13.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to soil and plant science.
0150.13.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of soil and plant science.

Standard 14: Process/Workplace Skills (0150.S.14)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0150.14.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0150.14.2 Explore careers available in soil and plant science.
0150.14.3 Use a variety of sources to investigate the educational requirements of various careers in soil and plant science.
0150.14.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0150.14.5 Demonstrate correct language usage in all oral and written work.
0150.14.6 Perform effectively in both leadership and non-leadership roles.
0150.14.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0150.14.8 Participate as a team member to complete a variety of assignments.

Forestry 1

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Leadership Develop (0182.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Develop Objectives
Students will:
0182.1.1 Identify the year FFA was formed.
0182.1.2 Name the author of the creed.
0182.1.3 Identify the location of the state and national convention.
0182.1.4 Name the state and national FFA advisor.
0182.1.5 Name the degree levels in FFA.
0182.1.6 Identify parts of the emblem.

Standard 2: Safety Principles in Forestry (0182.S.2)
Students will identify and utilize appropriate safety equipment and regulations.

Safety Principles in Forestry Objectives
Students will:
0182.2.1 Wear appropriate safety gear.
0182.2.2 Maintain a safe working environment.
0182.2.3 Identify safety hazards of fire line construction and mop-up.

Standard 3: Identify Economic Trees in West Virginia (0182.S.3)
Students will demonstrate the skill of tree identification with various methods.

Economic Trees in West Virginia Objectives
Students will:
0182.2.1 Identify the following trees:
- Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine

0182.2.2 Identify by leaves.
0182.2.3 Identify by bark.
0182.2.4 Identify by taste and smell.
0182.2.5 Identify by twigs.
0182.2.6 Identify by fruit.
0182.2.7 Understand tree morphology.

Standard 4: Forest Fire Fighting Procedures (0182.S.4)
Students will demonstrate correct methods and use of proper equipment to control forest fires.

Forest Fire Objectives
Students will:
0182.4.1 Construct fire line using hand tools.
0182.4.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
0182.4.3 Extinguish remaining fire spots after main fire is contained (mop-up).
0182.4.4 Determine direction for fire line construction.
0182.4.5 Repair and service equipment after fire is extinguished.

0182.4.6 Use backpack pump to fight fire directly.

Standard 5: Forest Measurement Techniques (0182.S.5)
Students will identify and demonstrate forest measurement techniques.

Forest Measurement Techniques Objectives
Students will:
0182.5.1 Set up instrument for surveying.
0182.5.2 Use compass to maintain direction.
0182.5.3 Make linear measurements using surveyor's chain with compass.
0182.5.4 Make linear measurements by pacing with compass.
0182.5.5 Calculate the number of acres in a timber tract.
0182.5.6 Use hand/staff compass to determine bearing or Azimuth.
0182.5.7 Identify units of measurement (mile, rod, chain and acre).

Standard 6: Silviculture Treatment for Timber Stand Improvement (0182.S.6)
Students will identify silvicultural procedures.

Silviculture Treatment Objectives
Students will:
0182.6.1 Determine major forest type and primary uses.
0182.6.2 Determine proper spacing using D+6 rule.
0182.6.3 Use increment borer to determine age and growth rate.
0182.6.4 Select and utilize pruning and thinning methods for a timber stand.
0182.6.5 Fell and limb trees.

Standard 7: Laboratory Investigations/Hands-On Learning (0182.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0182.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0182.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0182.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0182.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Chainsaw Safety (0183.S.1)
Students will demonstrate proper safety techniques for chainsaw usage.

Chainsaw Safety Objectives
Students will:
0183.1.1 Identify and use safety clothing and equipment.
0183.1.2 Use proper starting techniques.
0183.1.3 Identify proper safety rules with 100% accuracy.
0183.1.4 Identify and correct hazardous operational conditions.

Standard 2: Chainsaw Maintenance (0183.S.2)
Students will demonstrate proper chainsaw maintenance.

Chainsaw Maintenance Objectives
Students will:
0183.2.1 Properly sharpen chain.
0183.2.2 Determine and adjust chain for proper tension.
0183.2.3 Demonstrate proper cleaning and storage of chainsaw.
0183.2.4 Replace sprocket on chainsaw.
0183.2.5 Replace bar on chainsaw.
0183.2.6 Replace broken chain link.
0183.2.7 Clean and service carburetor and air cleaner.
0183.2.8 Replace chain clutch as needed.
0183.2.9 Adjust carburetor for maximum efficiency.
0183.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber (0183.S.3)
Students will correctly calculate the volume of standing timber using various tools and scales.

Volume of Standing Timber Objectives
Students will:
0183.3.1 Define and calculate board foot and cord wood volumes.
0183.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
0183.3.3 Determine number of logs per tree using tree stick or clinometers.
0183.3.4 Record volume number of individual trees using tally sheet method.
0183.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0183.3.6 Calculate volume of pulpwood by cords.

Standard 4: Wildlife Habitat Management (0183.S.4)
Students will demonstrate proper techniques to develop wild life habitat through forestry practices.

Wildlife Habitat Management Objectives
Students will:
0183.4.1 Monitor and improve water quality.
0183.4.2 Improve habitat for bird, fish and game.
0183.4.3 Understand the importance of the forest, field and edge.
0183.4.4 Identify potential den and mast trees.

Standard 5: Laboratory Investigations – Hands-On Learning (0183.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:

0183.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0183.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0183.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0183.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Technology Applications in Forestry (0183.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0183.6.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0183.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0183.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

0183.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Personal Leadership Skills Development (0184.S.1)
Students will conduct research in the forest industry and make presentations.

Personal Leadership Skills Development Objectives
Student will:
0184.1.1 Describe the parts of a good speech.
0184.1.2 Explain how to present a desirable speech.
0184.1.3 Correctly conduct research in topics concerning forestry.
0184.1.4 Deliver a speech on a forestry topic.

Standard 2: Advanced Dendrology Skills (0184.S.2)
Students will demonstrate advanced skills in tree identification.

Advanced Dendrology Skills Objectives
Students will:
0184.2.1 Identify by flowers.
0184.2.2 Identify by growth characteristics.
0184.2.3 Identify by site conditions.
0184.2.4 Identify by distribution.

Standard 3: Safety Training in Forestry (0184.S.3)
Students will demonstrate safety practices with equipment used in forestry.

Safety Training Objectives
Students will:
0184.3.1 Demonstrate safety with hand tools.
0184.3.2 Demonstrate safety with chainsaws.
0184.3.3 Demonstrate safety with tractors.
0184.3.4 Demonstrate safety on the fire line.

Standard 4: Operation and Maintenance of Forestry Equipment (0184.S.4)
Students will demonstrate operation and maintenance of equipment used in forestry.

Forestry Equipment Objectives
Students will:
0184.4.1 Demonstrate the proper use and maintenance of hand tools.
0184.4.2 Demonstrate the proper use and maintenance of chainsaws.
0184.4.3 Demonstrate the proper use and maintenance of tractors.
0184.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Silvicultural Applications for Timber Stands (0184.S.5)
Students will apply silviculture practices in timber stands.

Timber Stands Objectives
Students will:
0184.5.1 Demonstrate forest reproduction techniques.

0184.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
0184.5.3 Define clear-cut.

Standard 6: Laboratory Investigations/Hands-on Learning (0184.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0184.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0184.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0184.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0184.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0184.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0184.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0184.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0184.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0184.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Parliamentary Procedure (0185.S.1)
Students will demonstrate parliamentary procedure.

Parliamentary Procedure Objectives
Students will:
0185.1.1 Identify proper procedures for conducting a meeting.
0185.1.2 Write and present a committee report.
0185.1.3 Identify components of a program of activities.

Standard 2: Safety Procedures in Fire Line Construction (0185.S.2)
Students will demonstrate procedures to safely construct a fire line.

Fire Line Construction Objectives
Students will:
0185.2.1 Explain fire line safety.
0185.2.2 Explain fire line construction.
0185.2.3 Explain forest fire mop-up.
0185.2.4 Explain the use of topographic maps in locating access roads and trails.
0185.2.5 Explain the use of topographic maps in fire location.
0185.2.6 Repair, service and store equipment.

Standard 3: Use of Forest Surveying Equipment (0185.S.3)
Students will utilize equipment necessary to survey a forest.

Forest Surveying Equipment Objectives
Students will:
0185.3.1 Interpret surface features using aerial photography and topographic maps.
0185.3.2 Conduct a boundary survey using a hand compass and pacing.
0185.3.3 Visit a courthouse and conduct a title search.
0185.3.4 Plot bearings from deeds.
0185.3.5 Calculate percent slope using a clinometer.
0185.3.6 Orientate topographic map using hand compass.
0185.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Utilization of Best Management Practices (0185.S.4)
Students will describe the best management practices in forest road construction.

Best Management Practices Objectives
Students will:
0185.4.1 Lay out roads in compliance with West Virginia forest standards.
0185.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0185.4.3 Describe the process of installing culverts, water breaks and "woods" bridges.
0185.4.4 Design skid roads.
0185.4.5 Monitor water quality.
0185.4.6 Reseed skid trails and log landings.

Standard 5: Wood Products Utilization (0185.S.5)
Students will process, measure and market forest products.

Wood Products Utilization Objectives
Students will:
0185.5.1 Demonstrate competency in felling, bucking and skidding selected trees.
0185.5.2 Scale logs and lumber.
0185.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Laboratory Investigations – Hands-On Learning (0185.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0185.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0185.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0185.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0185.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0185.S.7)
Students will apply technology to investigate real-world problems.

Forestry Objectives
Students will:
0185.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0185.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0185.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0185.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Forestry Equipment: Identification and Use (0186.S.1)
Students will demonstrate safe use of forestry equipment.

Forestry Equipment Objectives
Students will:
0186.1.1 Identify and use the following:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

Standard 2: Conduct a Timber Cruise (0186.S.2)
Students will demonstrate skills needed to conduct a timber cruise using various equipment.

Timber Cruise Objectives
Students will:
0186.2.1 Mark boundaries and corners of tract.
0186.2.2 Use compass to direct cruising operation.
0186.2.3 Measure distance between plot center (by pacing).
0186.2.4 Record trees using tally sheet method.
0186.2.5 Use wedge prism (BAF 10 or BAF 20).
0186.2.6 Calculate board foot volumes using double log scale.

Standard 3: Application of Best Management Practices (0186.S.3)
Students will apply best management practices in a forestry setting.

Application of Best Management Practices Objectives
Students will:
0186.3.1 Lay out roads in compliance with West Virginia forest standards.
0186.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0186.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
0186.3.4 Design skid roads.
0186.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
0186.3.6 Scale logs and lumber.
0186.3.7 Monitor water quality.
0186.3.8 Reseed skid trails and log landings.

Standard 4: Laboratory Investigations – Hands-On Learning (0186.S.4)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0186.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0186.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0186.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0186.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Technology Applications in Forestry (0186.S.5)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0186.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0186.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0186.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom a assignments related to forestry.

0186.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Process/Workplace Skills in Forestry (0186.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0186.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0186.6.2 Explore careers available in forestry.

0186.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

0186.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0186.6.5 Demonstrate correct language usage in all oral and written work.

0186.6.6 Perform effectively in both leadership and non-leadership roles.

0186.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0186.6.8 Participate as a team member to complete a variety of assignments.

Forestry Science And Ecology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the forestry industry. Major instructional concepts include the scientific aspects of dendrology, silviculture, integrated wildlife management and ecology. Additionally, the student will study safety, surveying and measuring timber.

Standard 1: Leadership Development (0187.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Development Objectives
Students will:
0187.1.1 Identify the year FFA was formed.
0187.1.2 Name the author of the creed.
0187.1.3 Identify the location of the state and national convention.
0187.1.4 Name the state and national FFA advisor.
0187.1.5 Name the degree levels in FFA.
0187.1.6 Identify parts of the emblem.

Standard 2: Safety (0187.S.2)
Students will identify and utilize appropriate safety procedures associated with forestry.

Safety Objectives
Students will:
0187.2.1 Wear appropriate safety gear.
0187.2.2 Maintain a safe working environment.
0187.2.3 Identify and use safety clothing and equipment.
0187.2.4 Identify proper safety rules with 100% accuracy.
0187.2.5 Identify and correct hazardous operational conditions.

Standard 3: Fire Line Safety (0187.S.3)
Students will demonstrate appropriate safety practices involved in creating a fire line.

Fire Line Safety Objectives
Student will:
0187.3.1 Identify fire fighting tools.
0187.3.2 Explain fire line safety.
0187.3.3 Explain fire line construction.
0187.3.4 Explain forest fire mop-up.
0187.3.5 Explain the use of topographic maps in location access roads and trails.
0187.3.6 Explain the use of topographic maps in fire location.

Standard 4: Forestry Equipment (0187.S.4)
Students will identify equipment associated with forestry and explain their use.

Forestry Equipment Objectives
Students will:
0187.4.1 Identify by sight:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

0187.4.2 Explain the use of each tool.

Standard 5: Dendrology (0187.S.5)
Students will demonstrate appropriate tree identification techniques.

Dendrology Objectives
Students will:
0187.5.1 Identify by leaves.
0187.5.2 Identify by bark.
0187.5.3 Identify by twigs.
0187.5.4 Identify by fruit.

Standard 6: Measurements (0187.S.6)
Students will demonstrate various methods of measurements involving forestland and product measurements.

Measurements Objectives
Students will:
0187.6.1 Organize and set up instruments for surveying.
0187.6.2 Use compass to maintain direction.
0187.6.3 Make linear measurements using surveyor's chain with compass.
0187.6.4 Make linear measurements by pacing with compass.
0187.6.5 Calculate the number of acres in a timber tract.
0187.6.6 Use hand/staff compass to determine bearing or Azimuth.
0187.6.7 Identify units of measurement (mile, rod, chain and acre.)
0187.6.8 Define and calculate board foot and cord wood volumes.
0187.6.9 Measure standing trees at diameter breast height using tree stick and diameter tape.
0187.6.10 Determine number of logs per tree using tree stick or clinometer.
0187.6.11 Record volume number of individual trees using tally sheet method.
0187.6.12 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0187.6.13 Calculate volume of pulpwood by cords.
0187.6.14 Interpret surface features using aerial photography and topographic maps.
0187.6.15 Conduct a boundary survey using hand compass and pacing.
0187.6.16 Calculate percent slope using a clinometer.
0187.6.17 Orientate topographic map using hand compass.
0187.6.18 Mark boundaries and corners of tract.
0187.6.19 Use compass to direct cruising operation.
0187.6.20 Measure distance between plot center (by pacing).
0187.6.21 Record trees using tally sheet method.
0187.6.22 Use wedge prism (BAF 10 or BAF 20).
0187.6.23 Calculate board foot volumes using double log scale.

Standard 7: Silviculture (0187.S.7)
Students will utilize various silviculture practices.

Silviculture Objectives
Students will:
0187.7.1 Determine major forest type and primary uses.
0187.7.2 Determine proper spacing using D+6 rule.
0187.7.3 Use increment borer to determine age and growth rate.
0187.7.4 Recognize insect and disease damage and mark damaged area for salvage.
0187.7.5 Identify forest reproduction techniques.
0187.7.6 Demonstrate the technique of girdling in the process of removing undesirable trees.
0187.7.7 Define clear-cutting.

Standard 8: Wildlife (0187.S.8)
Students will demonstrate correct wildlife management skills.

Wildlife Objectives
Students will:
0187.8.1 Monitor and improve water quality.
0187.8.2 Improve habitat for bird, fish and game.
0187.8.3 Understand the importance of the forest, field and edge.
0187.8.4 Identify potential den and mast trees.

Standard 9: Best Management Practices (0187.S.9)
Students will demonstrate an awareness of best management practices used in forestry.

Best Management Practices Objectives
Students will:
0187.9.1 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0187.9.2 Understand the importance of installing culverts, water breaks and "woods" bridges.
0187.9.3 Design skid roads.
0187.9.4 Monitor water quality.

Natural Resource Management 1

This agricultural science course is designed to provide students with science concepts and skills in natural resource management that will be useful in various occupations in the field. Major emphasis will be on the scientific concepts involving air, water, aquatic life, wildlife management and recreation. Interaction of ecosystems and their relationship to human populations will be studied. This field of study will prepare students for entry-level occupations in the natural resources area.

Standard 1: Natural Resource and the Environment (0188.S.1)
Students will describe the relationship between natural resources and the environment.

Natural Resource and the Environment Objectives
Students will:
0188.1.1 Identify exhaustible and inexhaustible resources.
0188.1.2 Explain the importance of natural resources.
0188.1.3 Describe the interaction of people with the environment.

Standard 2: Air and Quality (0188.S.2)
Students will explain the importance of air and maintaining its quality.

Air and Quality Objectives
Students will:
0188.2.1 Identify air pollutants and their sources.
0188.2.2 Describe the effect of air pollution on humans, other living things and materials.
0188.2.3 Sample, monitor and analyze air quality for physical and chemical properties.
0188.2.4 Examine wind (air) as an alternative energy source.

Standard 3: Water Quality (0188.S.3)
Students will explain the importance of water and maintaining its quality.

Water Quality Objectives
Students will:
0188.3.1 Identify sources of water and water pollutants.
0188.3.2 Explain the effect of water pollution on the ecosystem.
0188.3.3 Describe the hydroponical cycle.
0188.3.4 Identify point and non-point source pollution.
0188.3.5 Describe wetlands, their use, importance and preservation.
0188.3.6 Identify uses of water in agriculture.
0188.3.7 Explain methods of managing wastewater.
0188.3.8 Determine composition of wastewater using water-testing equipment.
0188.3.9 Explain methods of protecting water sources.

Standard 4: Aquatic Life (0188.S.4)
Students will demonstrate aquatic life and natural resource management skills.

Aquatic Life Objectives
Students will:
0188.4.1 Identify game fish species and other aquatic wildlife.
0188.4.2 Explain water quality requirements for aquatic wildlife.
0188.4.3 Explain fishing laws and regulations.
0188.4.4 Describe fish hatchery techniques.
0188.4.5 Check for pond oxygen deficiency and prescribe remedial programs.
0188.4.6 Explain stratification and fish adaptability.

0188.4.7 Identify a management plan for a designated stream, lake or pond.

Standard 5: Wildlife (0188.S.5)
Students will demonstrate of wildlife management skills.

Wildlife Objectives
Students will:
0188.5.1 Identify and classify species of birds and wildlife animals.
0188.5.2 List governmental agencies concerned with wildlife conservation.
0188.5.3 Outline a plan for stimulating native and introduced game populations.
0188.5.4 Outline a plan for hatching game bird eggs.
0188.5.5 Identify common diseases of game birds and animals.
0188.5.6 Identify practices that can be used to protect wildlife.
0188.5.7 Evaluate wildlife food and cover crops.
0188.5.8 Estimate animal populations on given areas of land.

Standard 6: Outdoor Recreation (0188.S.6)
Students will demonstrate competencies in outdoor recreation management.

Outdoor Recreation Objectives
Students will:
0188.6.1 List demands by the public for different types of outdoor recreation experiences.
0188.6.2 Recognize types of natural resources recreational areas and the service and facilities required.
0188.6.3 Recognize the income potential from various types of recreational enterprises.
0188.6.4 Identify business procedures required of a recreational enterprise.
0188.6.5 Describe local, state and federal laws pertaining to given enterprises.
0188.6.6 Design advertising media to promote a recreation area effectively.

Standard 7: Leadership (0188.S.7)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0188.7.1 Participate in FFA meetings and activities.
0188.7.2 Utilize record keeping skills in work-based experience programs (SAE).

Standard 8: Laboratory Investigations (0188.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0188.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0188.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0188.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0188.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 9: Technology Applications (0188.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0188.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0188.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0188.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.

0188.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 10: Process/Workplace Skills (0188.S.10)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0188.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0188.10.2 Explore careers available in natural resource management.

0188.10.3 Use a variety of sources to investigate the educational requirements of various careers in natural resource management.

0188.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0188.10.5 Demonstrate correct language usage in all oral and written work.

0188.10.6 Perform effectively in both leadership and non-leadership roles.

0188.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0188.10.8 Participate as a team member to complete a variety of assignments.

Natural Resource Management II

This agricultural science course is designed to provide students with advanced science concepts and skills in natural resource management. Major emphasis will be on soil, forestry, and land use planning including solid waste and hazardous waste disposal and soil fertility. This field of study prepares students for entry-level occupations in the area of natural resources management.

Standard 1: Occupations in Natural Resources (0189.S.1)
Students will describe the occupations related to natural resources.

Occupations in Natural Resources Objectives
Students will:
0189.1.1 Identify occupations in natural resource management.
0189.1.2 Determine requirements for occupational entry in natural resource management fields.
0189.1.3 Identify typical activities performed by natural resource workers.

Standard 2: Soils (0189.S.2)
Students will explain soils and their role in natural resource management.

Soils Objectives
Students will:
0189.2.1 Identify factors that affect soil formation and describe the significance of each.
0189.2.2 Make "feel" tests of wet and dry soil samples and classify each as sandy, loamy or clayey.
0189.2.3 Determine percentage of sand, loam and clay in soil samples and classify according to texture.
0189.2.4 Classify samples of topsoil in one of the three color groups.
0189.2.5 Determine pH values of soil.
0189.2.6 Classify soils with respect to permeability.
0189.2.7 Determine moisture content of soil.
0189.2.8 Recognize causes of soil erosion.
0189.2.9 Categorize soils into their land use capability classes.
0189.2.10 Identify appropriate erosion control measures for soils.
0189.2.11 Read soil maps and interpret terms and symbols.
0189.2.12 Develop a conservation land use plan for a farm.

Standard 3: Soil Fertility (0189.S.3)
Students will perform competencies related to maintaining soil fertility.

Soil Fertility Objectives
Students will:
0189.3.1 Collect soil samples, complete data forms and submit to a laboratory for analysis.
0189.3.2 Test soil for acidity or alkalinity and prescribe remedial measures.
0189.3.3 Make plant tissue analyses.
0189.3.4 Explain analysis data on a fertilizer tag.
0189. 3.5 Identify macronutrients and their deficiency symptoms.

Standard 4: Forestry (0189.S.4)
Students will explain the role of forestry principles in natural resource management.

Forestry Objectives
Students will:
0189.4.1 Relate benefits of forest resources to land, human and economic requirements.
0189.4.2 Recognize and name forest products.
0189.4.3 Identify tree parts and their functions.

0189.4.4 Identify common tree species.
0189.4.5 Plant tree seedlings using approved practices.
0189.4.6 Identify common tree pests and diseases.
0189.4.7 Prescribe control measures for pests and diseases.
0189.4.8 Describe the effect of forest fires on the forest floor.
0189.4.9 Identify fire suppression tools and equipment and state their functions.

Standard 5: Land Use Planning (0189.S.5)
Students will describe the principles of land use planning.

Land Use Planning Objectives
Students will:
0189.5.1 Outline steps in the land use planning process.
0189.5.2 Assemble information pertinent to developing a comprehensive plan.
0189.5.3 Describe functions of comprehensive plans and zoning ordinances.
0189.5.4 Obtain distances by pacing and using steel tapes.
0189.5.5 Use appropriate equipment to conduct a basic survey.
0189.5.6 Give legal descriptions of selected plots of land.
0189.5.7 Run a traverse with the surveyor's staff compass.

Standard 6: Minerals (0189.S.6)
Students will explain the role of minerals in natural resource management.

Minerals Objectives
Students will:
0189.6.1 Identify and classify samples of rocks and minerals common to the state.
0189.6.2 Describe formation of coal in the earth's crust.
0189.6.3 List functions of common minerals.
0189.6.4 Describe procedures in locating, extracting and processing minerals.
0189.6.5 Describe the impact of mining on the environment.
0189.6.6 Identify methods of mineral conservation.
0189.6.7 Identify a plan for restoration of an area that has been disturbed by mineral extraction.

Standard 7: Solid Waste (0189.S.7)
Students will describe the concepts of solid waste management.

Solid Waste Objectives
Students will:
0189.7.1 Describe kinds and sources of solid waste.
0189.7.2 Explain hazards in solid waste materials and disposal.
0189.7.3 Describe methods of solid waste disposal.
0189.7.4 Explain recycling.
0189.7.5 Describe composting.
0189.7.6 Explore methods and benefits of composting.

Standard 8: Hazardous Waste (0189.S.8)
Students will describe the concepts of hazardous waste management.

Hazardous Waste Objectives
Students will:
0189.8.1 Explain hazardous waste.
0189.8.2 Describe ecotoxicology.
0189.8.3 Explain disposing of hazardous waste.
0189.8.4 Explain safety procedures and clean-up of spills.

Standard 9: Leadership (0189.S.9)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0189.9.1 Participate in FFA meetings and activities.

Standard 10: Supervised Agricultural Experience Program (SAE) (0189.S.10)
Students will conduct a supervised agricultural experience program.

SAE Objectives
Students will:
0189.10.1 Conduct an experience program in the natural resource management area.
0189.10.2 Maintain appropriate records on the experience program.

Standard 11: Laboratory Investigations (0189.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0189.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0189.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0189.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0189.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 12: Technology Applications (0189.S.12)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0189.12.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0189.12.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0189.12.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.
0189.12.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 13: Process/Workplace Skills (0189.S.13)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0189.13.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize,

analyze, and report data.

0189.13.2 Explore careers available in natural resource management.

0189.13.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.

0189.13.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0189.13.5 Demonstrate correct language usage in all oral and written work.

0189.13.6 Perform effectively in both leadership and non-leadership roles.

0189.13.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0189.13.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Leadership and Communication Development (0190.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0190.1.1 Identify FFA history.
0190.1.2 Demonstrate proper use of parliamentary procedure.
0190.1.3 Participate in FFA activities.
0190.1.4 Prepare and deliver a brief presentation on a wildlife or natural resource topic.

Standard 2: History of Wildlife Management (0190.S.2)
Students will describe the importance of wildlife management and its impact on conservation.

History of Wildlife Management Objectives
Students will:
0190.2.1 Define and describe wildlife trends and their impact on management.
0190.2.2 Identify wildlife legalities and ethics.
0190.2.3 Define natural resources conservation.

Standard 3: Concepts of Wildlife Management (0190.S.3)
Students will describe the relationships between wildlife, humans and the ecosystem.

Concepts of Wildlife Management Objectives
0190.3.1 Define succession stages related to wildlife management.
0190.3.2 Describe carrying capacity as related to wildlife.
0190.3.3 Define horizontal and vertical structuring.
0190.3.4 Explain ecological principles and their application to wildlife management.

Standard 4: Habitat Management Practices (0190.S.4)
Students will determine the relationship between wildlife and the environment with approved practices in managing wildlife habitat.

Habitat Management Practices Objectives
Students will:
0190.4.1 Explain ecological principles applied to fish and wildlife.
0190.4.2 Design a wildlife management plan.
0190.4.3 Identify forest management practices for improving habitat.
0190.4.4 Identify agricultural management practices for improvement of habitat.
0190.4.5 Define and describe wetlands and their use.
0190.4.6 Identify government assistance available for habitat improvement.
0190.4.7 Construct and erect wildlife feeders/nest boxes.

Standard 5: Animal Life Histories (0190.S.5)
Students will use technology to identify the characteristics of wildlife and the relationship between species.

Animal Life Histories Objectives
Students will:

0190.5.1 Identify life cycles of wildlife species.
0190.5.2 Describe interrelationship of wildlife species.
0190.5.3 Identify common relationships between humans and wildlife.
0190.5.4 Search the Internet to secure wildlife information.

Standard 6: Water and Water Quality (0190.S.6)
Students will determine the relationships between water and the environment and the recommended practices for conserving these resources.

Water Objectives
Students will:
0190.6.1 Identify sources of water and water pollutants.
0190.6.2 Explain the effects to water pollution on the ecosystem.
0190.6.3 Identify point and non-point source pollution and describe possible controls.
0190.6.4 Describe wetlands, their use, importance and preservation.
0190.6.5 Explain methods of protecting water sources.

Standard 7: Wildlife Values as a Resource (0190.S.7)
Students will describe the benefit of wildlife as a resource to society.

Wildlife Values Objectives
Students will:
0190.7.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
0190.7.2 Define recreational values of fish and wildlife.
0190.7.3 Describe social values of fish and wildlife.
0190.7.4 Identify esthetic values of fish and wildlife resources.
0190.7.5 Describe scientific and educational values of fish and wildlife.
0190.7.6 Evaluate negative impact of wild animals on humans.

Standard 8: Develop a Work-Based Experiential Program (SAE) in Wildlife Management (0190.S.8)
Students will explore careers and learn the rational for and plan a SAE.

SAE Objectives
Students will:
0190.8.1 Define and explain supervised experience programs in agricultural and natural resources.
0190.8.2 Explore opportunities for work-based learning in natural resources.
0190.8.3 Define record keeping terms for supervised experience programs.
0190.8.4 Establish a supervised experience program in agriculture or natural resources.

Grounds Maintenance

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation.

Standard 1: Leadership and Communication Development (0201.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0201.1.1 Participate in FFA activities and programs.
0201.1.2 Prepare and deliver short speeches.
0201.1.3 Identify interview and employment readiness skills.
0201.1.4 Prepare a resume.

Standard 2: Grounds Maintenance Tools and Equipment (0201.S.2)
Students will practice and demonstrate safety with ground maintenance tools, equipment and activities.

Grounds Maintenance Tools and Equipment Objectives
Students will:
0201.2.1 Identify tools and equipment used in grounds maintenance.
0201.2.2 Perform maintenance and service operations on tools and equipment.
0201.2.3 Use tools and equipment safely under job site conditions.
0201.2.4 Identify and safely use potentially hazardous fuels.

Standard 3: Control Pests in Lawns, Flowers and Shrubs (0201.S.3)
Students will explain the practices of safe pesticide use and the concept of integrated pest management.

Control Pests in Lawns, Flowers and Shrubs Objectives
Students will:
0201.3.1 Identify, calibrate and safely use equipment.
0201.3.2 Identify and use personal safety clothing and equipment.
0201.3.3 Identify common pests, diseases and appropriate control techniques including integrated pest management (IPM).
0201.3.4 Read and demonstrate understanding of pesticide labels.

Standard 4: Plant and Maintain Lawns, Flower Beds, and Shrubs (0201.S.4)
Students will demonstrate practices pertaining to the establishment and maintenance of lawns, flower beds and shrubs.

Plant and Maintain Lawns, Flower Beds, and Shrubs Objectives
Students will:
0201.4.1 Identify safe and appropriate mowing techniques.
0201.4.2 Use an edger following safety procedures.
0201.4.3 Aerate and dethatch turf.
0201.4.4 Irrigate lawn, flowers and shrubs.
0201.4.5 Take soil samples using correct procedures.
0201.4.6 Analyze soil test results and determine fertilizer needs.
0201.4.7 Apply fertilizer and lime to various areas.
0201.4.8 Prune shrubs according to recommended practices.
0201.4.9 Mulch landscape plants.
0201.4.10 Provide appropriate winter protection for plants.

Standard 5: Construct and Maintain Grounds Structures (0201.S.5)
Students will build and maintain permanent structures within a landscaped design.

Grounds Structures Objectives
Students will:
0201.5.1 Mix and pour concrete.
0201.5.2 Build and maintain wood structures.
0201.5.3 Seal asphalt walks and driveways.

Standard 6: Developing Work-Based Experiential Program (SAE) (0201.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0201.6.1 Explore opportunities for supervised agricultural experience programs.
0201.6.2 Establish a supervised agricultural experience program in grounds maintenance.
0201.6.3 Maintain records of experience program activities, expenses and earnings.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Leadership Development (0212.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0212.1.1 Demonstrate an awareness of FFA and its components.
0212.1.2 Utilize record-keeping skills in work-based experience programs.
0212.1.3 Develop and exhibit communication skills.
0212.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0212.1.5 Demonstrate personal and social skills.
0212.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Plant Classification and Identification (0212.S.2)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0212.2.1 Develop an understanding of the natural classification system for the plant kingdom.
0212.2.2 Identify plant species and explore their benefit to people.
0212.2.3 Identify and research plants that are important to the greenhouse industry.
0212.2.4 Describe the plant processes involved with plant growth and development.
0212.2.5 List plant growth regulators and document their effects on plants.
0212.2.6 Explain how essential elements become available for plant use.
0212.2.7 Identify and document the effects of environmental factors on plant growth.
0212.2.8 Compare and contrast types of plant-growing media.
0212.2.9 Determine appropriate amendments for optimum plant growth.
0212.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Plant Processes and Propagation (0212.S.3)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0212.3.1 Perform methods of propagating plants.
0212.3.2 Manipulate total environment from juvenile to mature plant.
0212.3.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Pest Management (0212.S.4)
Students will identify proper pesticide use and pest management.

Pest Management Objectives
Students will:
0212.4.1 Explain and apply the concepts of integrated pest management.
0212.4.2 Identify safety guidelines for tools, equipment and pesticide use.

0212.4.3 Identify pests and evaluate control methods according to label interpretation.
0212.4.4 Recognize, calibrate and operate pesticide application equipment.
0212.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
0212.4.6 Demonstrate knowledge of and interpret federal and state pesticide laws.

Standard 5: Selected Specialty Areas in Horticulture (0212.S.5)
Students will identify the various specialty areas in horticulture.

Specialty Areas in Horticulture Objectives
Students will:
0212.5.1 Explore professions in floriculture and understand the scope of job opportunities.
0212.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.
0212.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.
0212.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.
0212.5.5 Explore professions in nursery production and understand job requirements.
0212.5.6 Demonstrate techniques and procedures used in the nursery production industry.
0212.5.7 Research careers in the landscape and turf industry.
0212.5.8 Perform basic landscape design, plantings and maintenance techniques.
0212.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Laboratory Investigation (0212.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0212.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0212.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0212.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0212.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications (0212.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0212.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in horticulture.
- Locate, evaluate, and collect information from a variety of sources related to horticulture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0212.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0212.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.
0212.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Process/Workplace Skills (0212.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0212.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0212.8.2 Explore careers available in horticulture.
0212.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.
0212.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0212.8.5 Demonstrate correct language usage in all oral and written work.
0212.8.6 Perform effectively in both leadership and non-leadership roles.
0212.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0212.8.8 Participate as a team member to complete a variety of assignments.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Leadership and Communication Development (0213.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0213.1.1 Describe FFA and its components.
0213.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0213.1.3 Identify appropriate career opportunities in the floriculture industry.
0213.1.4 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
0213.1.5 Develop personal relation and communication skills.
0213.1.6 Demonstrate an awareness of employment and floriculture industry ethics.

Standard 2: Principles of Design (0213.S.2)
Students will utilize principles of design to critique floral designs.

Principles of Design Objectives
Students will:
0213.2.1 Utilize floriculture principles, elements and theory of design.
0213.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
0213.2.3 Understand the concepts and use of color.

Standard 3: Cut Flowers and Greens (0213.S.3)
Students will identify and maintain commonly used cut flowers and foliage.

Cut Flowers and Greens Objectives
Students will:
0213.3.1 Identify and classify flowers and foliage.
0213.3.2 Understand the techniques to maintain optimum flower and foliage quality.

Standard 4: Floral Materials and Supplies (0213.S.4)
Students will identify and manipulate materials and supplies used in floral design.

Floral Materials and Supplies Objectives
Students will:
0213.4.1 Identify the basic mechanics and supplies used in floral design.
0213.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
0213.4.3 Demonstrate construction of bows.

Standard 5: Selected Specialty Areas (0213.S.5)
Students will design the appropriate product according to the occasion.

Selected Specialty Areas Objectives
Students will:
0213.5.1 Design boutonnieres and corsages.
0213.5.2 Understand concepts in floral design of holiday arrangements.
0213.5.3 Identify designs for weddings and receptions.
0213.5.4 Recognize practice in sympathy floral designs.
0213.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.

0213.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Floral Operations and Management (0213.S.6)
Students will develop strategies and understand the components used in floral operations and management.

Floral Operations and Management Objectives
Students will:
0213.6.1 Develop skills in retail sales using various selling techniques.
0213.6.2 Develop a visual merchandising plan to project the right image.
0213.6.3 Identify the components and the importance of a floral delivery system.
0213.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts provide students with individual goals and objectives including: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Leadership Development (0214.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0214.1.1 Demonstrate an awareness of FFA and its components.
0214.1.2 Utilize record-keeping skills in work-based experience programs.
0214.1.3 Develop and exhibit communication skills.
0214.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0214.1.5 Demonstrate personal and social skills.
0214.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Greenhouse Structure, Operation and Maintenance (0214.S.2)
Students will identify different greenhouse structures, operations and maintenance.

Greenhouse Structure, Operation and Maintenance Objectives
Students will:
0214.2.1 Identify different greenhouse parts and compare types of structures and coverings.
0214.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
0214.2.3 Diagram operational systems in the greenhouse operation.
0214.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Plant Classification and Identification (0214.S.3)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0214.3.1 Demonstrate an understanding of the natural classification system for the plant kingdom.
0214.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Environmental Control and Plant Growth (0214.S.4)
Students will identify the different environmental elements and plant growth.

Environmental Control and Plant Growth Objectives
Students will:
0214.4.1 Describe the plant processes involved with plant growth and development.
0214.4.2 List plant growth regulators and document their effects on plants.
0214.4.3 Explain how essential elements become available for plant use.
0214.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Greenhouse Media and Containers (0214.S.5)
Students will identify the greenhouse media effects and the different types of containers.

Greenhouse Media and Containers Objectives
Students will:
0214.5.1 Research the components of media and amendments.
0214.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
0214.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Plant Processes and Propagation (0214.S.6)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0214.6.1 Perform methods of propagating plants.
0214.6.2 Manipulate total environment from juvenile to mature plant.
0214.6.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identifying and Controlling Disease, Insects, and Weeds (0214.S.7)
Students will identify and control disease, insects and weeds with proper pesticide usage.

Disease, Insects, and Weeds Objectives
Students will:
0214.7.1 Identify and exhibit guidelines for pesticide use.
0214.7.2 Practice integrated pest management procedures.
0214.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Greenhouse Business Management (0214.S.8)
Students will identify the various types of managing a greenhouse business.

Greenhouse Business Management Objectives
Students will:
0214.8.1 Explore and discuss the various types of records kept in a greenhouse business.
0214.8.2 Use computers to solve problems related to greenhouse management.
0214.8.3 Describe the methods and determine the values and limitations of effective advertising.
0214.8.4 Develop a plan for profitable sales techniques.
0214.8.5 Record receipts and expenditures.

Standard 9: Laboratory Investigation (0214.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0214.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0214.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0214.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0214.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0214.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0214.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in greenhouse technology.
- Locate, evaluate, and collect information from a variety of sources related to greenhouse technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0214.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0214.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.

0214.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Process/Workplace Skills (0214.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0214.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0214.11.2 Explore careers available in greenhouse technology.

0214.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

0214.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0214.11.5 Demonstrate correct language usage in all oral and written work.

0214.11.6 Perform effectively in both leadership and non-leadership roles.

0214.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0214.11.8 Participate as a team member to complete a variety of assignments.

Landscape Design And Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, the students will implement the plan.

Standard 1: Leadership and Interpersonal Skill Development (0215.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0215.1.1 Participate in FFA activities.
0215.1.2 Write, deliver and evaluate a speech and/or presentation.
0215.1.3 Explore careers in the landscape industry.
0215.1.4 Determine appropriate job seeking and keeping skills.
0215.1.5 Describe ethical conduct.
0215.1.6 Utilize record-keeping skills in work-based experience programs (SAE).

Standard 2: Basic Landscape Design (0215.S.2)
Students will recognize and demonstrate basic principles of planning and implementing the landscape design.

Basic Landscape Design Objectives
Students will:
0215.2.1 Determine environmental requirements for landscape plant materials.
0215.2.2 Recognize the appropriate plants for landscape use.
0215.2.3 Interpret landscape symbols for a landscape plan.
0215.2.4 Operate computer assisted design programs.
0215.2.5 Demonstrate knowledge of drafting skills needed in a landscape plan.

Standard 3: Safe Use and Operation of Horticulture Tools and Equipment. (0215.S.3)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0215.3.1 Identify and properly use horticulture tools and equipment.
0215.3.2 Follow appropriate safety procedures and policies.
0215.3.3 Interpret and follow safety information from equipment manuals.
0215.3.4 Maintain and adjust safety devices.
0215.3.5 Service tools and equipment as to manufactures specifications.
0215.3.6 Operate equipment under job site conditions.

Standard 4: Implementation of the Landscape Design (0215.S.4)
Students will apply principles of landscape design.

Landscape Design Objectives
Students will:
0215.4.1 Prepare an area to be landscaped.
0215.4.2 Construct walkways and landscape structures.
0215.4.3 Install balled and burlapped, containerized and bare root plantings.
0215.4.4 Install herbaceous landscape plants.
0215.4.5 Place edging materials.
0215.4.6 Mulch a landscape site.
0215.4.7 Install turf areas.
0215.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. The students will understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Leadership and Interpersonal Skill Development (0216.S.1)
Students will demonstrate leadership skills through personal, organizational, and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0216.1.1 Participate in FFA activities and programs.
0216.1.2 Identify communication skills.
0216.1.3 Identify interview and employment readiness skills.
0216.1.4 Draft a resume.

Standard 2: Demonstrate Safe Use and Operation of Horticulture Tools and Equipment (0216.S.2)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0216.2.1 Identify and properly use horticulture tools and equipment.
0216.2.2 Follow appropriate safety procedures and policies.
0216.2.3 Interpret and follow safety information from equipment manuals.
0216.2.4 Maintain and adjust safety devices.
0216.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
0216.2.6 Operate equipment under job site conditions.
0216.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Using Pest Management Techniques (0216.S.3)
Students will describe safe pesticide use and the concept of integrated pest management.

Pest Management Techniques Objectives
Students will:
0216.3.1 Identify, calibrate, and properly use equipment.
0216.3.2 Identify and use personal safety equipment and protective clothing.
0216.3.3 Identify pests and the appropriate control techniques.
0216.3.4 Introduce Integrated Pest Management (IPM) techniques.
0216.3.5 Interpret pesticide labels and proper use as instructed.
0216.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Demonstrate Proper Landscape Maintenance Techniques (0216.S.4)
Students will maintain the landscape.

Landscape Maintenance Objectives
Students will:
0216.4.1 Determine and follow appropriate lawn care practices.
0216.4.2 Aerate and dethatch turf areas.
0216.4.3 Determine and implement irrigation needs for turf and landscaped areas.
0216.4.4 Identify appropriate soil testing procedures.
0216.4.5 Over-seed, lime, and fertilize as deemed necessary.
0216.4.6 Determine and implement proper pruning timelines and practices.

0216.4.7 Maintain landscape edging materials.
0216.4.8 Mulch landscape planting.
0216.4.9 Maintain landscape structures.
0216.4.10 Describe appropriate winter protection.
0216.4.11 Utilize record-keeping skills in work-based experience programs (SAE).

Business Law

This course focuses on the impact of law as it relates to business and individuals. Students will examine criminal and civil law with a concentration on consumer, contract, property, and employment laws while assessing ethics as they relate to each.

Standard 1: Ethics (1417.S.1)
Examine ethics related to business law.

Relationship of Ethics to Business Law Objectives
Students will:

1417.1.1 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship, and justice.
1417.1.2 Distinguish the various ways in which ethical decisions can be made.
1417.1.3 Describe why laws are needed.
1417.1.4 Explain the relationship between law and ethics and why they sometimes conflict.
1417.1.5 Compare and contrast the five major sources of today's law. (Federal and state constitutions, English common law, statutes, court decisions, and administrative law).

Standard 2: Criminal, Civil and Business Law (1417.S.2)
Identify the elements of criminal, civil and business law including trial procedures.

Elements of Criminal and Civic Law Objectives
Students will:

1417.2.1 Describe and define different types of crimes.
1417.2.2 Determine defenses to criminal acts.
1417.2.3 Distinguish between a tort and a crime.
1417.2.4 Differentiate between and give examples of negligence and intentional torts.
1417.2.5 Explain the concepts of the reasonable person test and proximate cause.
1417.2.6 Explain the concept of strict/absolute liability.
1417.2.7 Enumerate the steps in a civil and a criminal trial.
1417.2.8 Describe crimes affecting business.
1417.2.9 Explain civil rights when being accused of a crime.
1417.2.10 Distinguish between different types of courts.
1417.2.11 Explain duties of jurors and witnesses.

Standard 3: Contracts (1417.S.3)
Analyze contracts.

Contract Objectives
Students will:

1417.3.1 Identify the elements of a contract (offer, acceptance, genuine agreement, consideration, capacity, and legality).
1417.3.2 Discuss the requirements of an offer and acceptance and how the offer can be terminated/discharged.
1417.3.3 Explain a minor's right to avoid a contract and identify people who lack contractual capacity.
1417.3.4 List the essential information that should be included in writing under the statute of frauds.
1417.3.5 Explain the parole evidence rule.
1417.3.6 Describe breach of contract and the remedies available when a contract is breached.

Business Computer Literacy

This area of study is designed as a one semester course to reinforce proper keyboarding techniques, develop basic computer concepts and terminology skills, develop an understanding of ethical computer practices, explore the diverse educational uses of the Internet and introduce the use of (document) word processing, database, and/or spreadsheet computer applications.

Standard 1: Proper Keyboarding Techniques (1415.S.1)
Demonstrate proper keyboarding techniques on the computer.

Proper Keyboarding Technique Objectives
Students will:
1415.1.1 Demonstrate proper keyboarding techniques using the touch system.
1415.1.2 Develop skill on the keyboard using quick key commands found in application software.

Standard 2: Computer Careers, Uses, and Ethics (1415.S.2)
Identify computer careers, computer uses, and computer ethics.

Computer Careers, Uses, and Ethics Objectives
Students will:
1415.2.1 Identify careers found in the computer industry.
1415.2.2 Distinguish among the uses of computers for industry, business, and personal use including the benefits found in navigating the Internet.
1415.2.3 Demonstrate ethical procedures for the operation and management of a computer.
1415.2.4 Explain the impact of computers on society.
1415.2.5 Explain the computer's capabilities and limitations.

Standard 3: Basic Terminology and Concepts (1415.S.3)
Communicate basic computer terminology and concepts.

Basic Terminology and Concepts Objectives
Students will:
1415.3.1 Describe and identify computer hardware components by name.
1415.3.2 Define differences in word processing, database, and spreadsheet applications.
1415.3.3 Name commonly used programming languages and identify user groups of each.
1415.3.4 Explain the types of computers and examples for each.
1415.3.5 Communicate with others using computer vocabulary.

Standard 4: Hardware/Software Proficiency for Copy Production (1415.S.4)
Achieve basic proficiency in operating the computer in order to produce final copy and demonstrate correct usage of the hardware and software.

Basic Proficiency Operation Objectives (Hardware, Software, and Final Copy Production)
Students will:
1415.4.1 Define steps for the information processing cycle; input, processing output, storage.
1415.4.2 Explain procedures for handling different forms of media for saving and retrieving information.
1415.4.3 Demonstrate turning on and shutting down the computer properly and uses of the warm boot and cold boot commands.
1415.4.4 Distinguish between major operating systems currently on the market.
1415.4.5 Use the computer as a tool to perform simple information processing applications appropriate to the student's level and background.

Business Computer Applications II

This area of study is designed to develop entry-level skills appropriate to an area of specialization in information systems. Students will achieve proficiency in the use of software packages in the areas of database, word processing, spreadsheets and presentation/desktop publishing.

Standard 1: Computer Applications Concepts and Resources (1413.S.1)
Review computer application concepts and resources common to the work environment.

Common Applications Objectives
Students will:

1413.1.1 Demonstrate proper keyboarding techniques.
1413.1.2 Identify and demonstrate components and the proper care of hardware and software.
1413.1.3 Select appropriate application software.
1413.1.4 Explain the various types of operating systems.
1413.1.5 Be familiar with a variety of reference materials (such as manuals, on-line help, vendor bulletin boards, etc.) for finding solutions and learning software programs.
1413.1.6 Be familiar with periodicals dealing with emerging state-of-the-art computer hardware and software.
1413.1.7 Demonstrate ability in using a computer operating system.

Standard 2: Proficiency in Computer Applications (1413.S.2)
Achieve proficiency utilizing computer applications.

Application Objectives
Students will:

1413.2.1 Transfer text, images and data between software programs.
1413.2.2 Develop advanced computer skills with specific software applications.
1413.2.3 Identify communications software for specific tasks/hardware.
1413.2.4 Identify and demonstrate accessing, navigating and using on-line services.
1413.2.5 Send and receive electronic mail (e-mail and faxes).
1413.2.6 Compose, manipulate, proofread, edit and print word processing documents.
1413.2.7 Plan, create, store, query, retrieve, sort, update, add and delete records using database software.
1413.2.8 Plan, create, store, manipulate, retrieve, sort, update, and, search, sort, delete, chart and print data using spreadsheet software.
1413.2.9 Create, format, import data, scanned images and graphics to produce presentations of desktop publishing products.
1413.2.10 Prepare multimedia presentations by creating, designing, importing (data, graphics, scanned images, sound and video), formatting and editing.

Business Computer Applications I

This area of study is designed to provide the learner with the opportunity to understand and apply integrated software to business applications. The students will achieve basic proficiency in word processing, spreadsheet, desktop publishing, computerized presentations, Internet and/or database applications.

Standard 1: System Careers and Ethical Issues (1411.S.1)
Identify information system careers and ethical issues.

Careers and Ethical Issues of Information Systems Careers Objectives
Students will:

1411.1.1 Research educational requirements and skill experience for careers in information systems.
1411.1.2 Research how changing technology affects working environments and life styles.
1411.1.3 Demonstrate ethical procedures in the management of information systems.

Standard 2: Computer Hardware/Software Identification (1411.S.2)
Identify computer hardware and software.

Computer Hardware/Software Identification Objectives
Students will:

1411.2.1 Describe hardware components of a computer system.
1411.2.2 Demonstrate proper handling and care of software and hardware.
1411.2.3 Differentiate between system software and application software.
1411.2.4 Identify the difference between hardware and software.
1411.2.5 Develop an understanding of the concept of integrated software.
1411.2.6 Specify the difference between stand-alone computers and networked systems.

Standard 3: Utilizing Integrated Software Applications (1411.S.3)
Develop skills needed to apply integrated software applications to business procedures.

Applying Integrated Software Applications to Business Procedures Objectives
Students will:

1411.3.1 Demonstrate proper keyboarding techniques.
1411.3.2 Develop proper usage of word processing, database, and/or spreadsheet software terminology.
1411.3.3 Apply integrated software to perform input, processing, output and revision of various business documents.
1411.3.4 Employ the word processing function of an integrated package to complete a document requiring the use of commands to create, format, edit, save and print.
1411.3.5 Utilize the spreadsheet function of an integrated package to perform mathematical and logical operations and/or use the database function of an integrated package for file and database management (sort, combine and merge, etc.).
1411.3.6 Demonstrate proper use of multimedia software.
1411.3.7 Investigate Internet usage and electronic mail.
1411.3.8 Prioritize and complete assigned tasks using integrated software.
1411.3.9 Proofread and revise assigned projects to produce correct final output.
1411.3.10 Develop office scheduling and organizing skills (calendars, appointments and addresses).

1409.6.6 List and discuss qualities that employers expect in potential employees.
1409.6.7 Use correct strategies for accepting or rejecting an employment offer.
1409.6.8 Discuss alternative sources for job searches.
1409.6.9 Discuss appropriate oral and written steps in leaving a job (resignation, downsizing, exit interview).
1409.6.10 Discuss potential problems with signing employment contract and effective salary negotiation strategies.

1409.3.2 Identify and overcome major barriers to listening.
1409.3.3 Discuss the value of silence in communication as a nonverbal cue.
1409.3.4 Direct courteous attention to and synthesize information from multiple speakers within a group to obtain key facts and respond in an effective manner.
1409.3.5 Give examples of how nonverbal messages have different meanings in various cultures.
1409.3.6 Demonstrate a command of interactive listening techniques.
1409.3.7 Receive, interpret, and respond to verbal messages and other cues, such as body language, in ways that are appropriate.
1409.3.8 Demonstrate the ability to follow through on oral instructions in completing jobs.

Standard 4: Reading Strategies (1409.S.4)
Demonstrate use of reading strategies.

Reading Strategies Objectives
Students will:
1409.4.1 Distinguish between fact and opinion in written materials and electronic media (e.g., Internet).
1409.4.2 Analyze the integrity of printed or oral information.
1409.4.3 Explain career-specific terminology.
1409.4.4 Interpret business correspondence, professional articles, and supporting graphic material.
1409.4.5 Interpret information from manuals, computer printouts, and other electronic sources.
1409.4.6 Select an appropriate reading method for a particular situation (e.g., skimming, scanning, speed reading, and in-depth reading).
1409.4.7 Identify and discuss the intent of printed propaganda and its impact on decision-making.

Standard 5: Basic Social Communication Skills (1409.S.5)
Apply basic social communication skills in personal and professional situations that prepare a student to be adaptable in a global business environment.

Basic Social Communication Objectives
Students will:
1409.5.1 Analyze personal self-concept and design a program for improvement.
1409.5.2 Explain the role that self-concept plays in one=s personal and professional life.
1409.5.3 Select appropriate business attire and demonstrate good grooming and personal hygiene.
1409.5.4 Display a positive attitude in personal and professional settings.
1409.5.5 Understand and develop an appropriate work ethic.
1409.5.6 Apply team skills in a business environment.
1409.5.7 Apply the principles of group dynamics in structured activities.
1409.5.8 Demonstrate appropriate responses to passive, assertive, and aggressive behavior.
1409.5.9 Select appropriate communication techniques to avoid, minimize, or prevent conflicts.
1409.5.10 Respect the customer-client confidentiality.

Standard 6: Communications in a Career (1409.S.6)
Integrate all forms of communication in the successful pursuit of a career.

Career Communication Objectives
Students will:
1409.6.1 Complete systematic career and job analysis.
1409.6.2 Compose formal letters of application, create an appropriate resume, complete application forms, and compose follow-up letters for job opportunities.
1409.6.3 Participate in and analyze mock interviews in various situations.
1409.6.4 Discuss and demonstrate the importance of appropriate dress in an interview situation.
1409.6.5 Discuss the significance of nonverbal communications in the interviewing process.

Business Communication

This area of study will focus on the application of communication skills through a variety of informal and formal experiences. The performance-based course will emphasize effective interpersonal and team building skills. Technology will be used to create and deliver presentations, to enhance problem-solving situations, and to practice critical thinking and decision-making. Job interview, research paper, or a senior project will culminate this course. ***Strongly Recommended: At least a AC@ average in English courses previously completed.***

Standard 1: Oral Communications (1409.S.1)
Communicate orally in a clear, courteous, concise, and responsible manner on personal and professional levels.

Oral Communication Objectives
Students will:

1409.1.1 Use standard oral English usage.
1409.1.2 Organize thoughts to reflect logical, positive, and tactful thinking before speaking.
1409.1.3 Participate in group discussion and role playing for problem solving.
1409.1.4 Ask/Answer impromptu questions with confidence to elicit information in the exchange of ideas in a formal/informal setting (e.g., interview or formal classroom discussion).
1409.1.5 Discuss and demonstrate steps in creating and using proper techniques in making a formal oral presentation.
1409.1.6 Use proper telephone techniques and etiquette to gather and record information.
1409.1.7 Demonstrate an awareness and acceptance of international, regional, and multicultural speech.

Standard 2: Composing Correspondence (1409.S.2)
Compose correspondence that uses Standard English usage, acceptable format, and proper mechanics.

Composing Correspondence Objectives
Students will:

1409.2.1 Compose a variety of business letters, memorandums, reports, and electronic messages using correct style, format, and content that promotes a positive response utilizing the "You" approach to business writing.
1409.2.2 Use acceptable steps in the writing process.
1409.2.3 Identify factors affecting the readability for specific audiences.
1409.2.4 Proofread business documents to ensure that they are clear, correct, concise, complete, consistent, and courteous.
1409.2.5 Avoid use of language bias (e.g., gender, religion, physically challenged, or race, etc.).
1409.2.6 Use a variety of references, resources, and graphics (both electronic and printed) for the purpose of writing business documents.
1409.2.7 Analyze and respond in writing to routine business problems both individually and collaboratively.

Standard 3: Listening and Observation Skills (1409.S.3)
Use active listening and observation skills to understand the positions of others, and use verbal and nonverbal cues from others to communicate effectively in return.

Active Listening and Observations Using Verbal/Nonverbal Objectives
Students will:

1409.3.1 Listen objectively, assess, and respond/record major points of a speaker's message including nonverbal messages.

Standard 4: Basic Computer Skills (1407.S.4)
Demonstrate basic computer skills.

Basic Computer Skill Objectives
Students will:
1407.4.1 Identify hardware components.
1407.4.2 Demonstrate the proper care and use of hardware and software.
1407.4.3 Demonstrate proficiency in using operating system commands.
1407.4.4 Demonstrate the functions and common features of word processing software.
1407.4.5 Use document processing terminology.

Standard 5: Investigate careers. (1407.S.5)
Investigate careers utilizing keyboarding skills.

Investigate Careers Objective
Students will:
1407.5.1 Integrate the relevance of keyboarding skills to all occupational areas.

Basic Keyboarding

This area of study is designed as a one-semester course to provide learners with keyboarding skills required for success in academic and occupational areas. Concepts in this area include keyboard operation, formatting skills, computer skills, appropriate work habits, and career awareness.

Standard 1: Work Habits (1407.S.1)
Exhibit good work habits.

Work Habits Objectives
Students will:

1407.1.1 Follow oral and written instructions in the completion of assigned tasks and work efficiently to meet deadlines.
1407.1.2 Exhibit the attitudes and work habits necessary for good interpersonal and employee/ employer relations in the workforce.
1407.1.3 Keep the area in and around the workstation organized by properly assembling supplies and information necessary to complete assigned tasks.
1407.1.4 Illustrate desirable work ethics.

Standard 2: Keyboarding Operational Skills (1407.S.2)
Demonstrate proper keyboard operation skills.

Proper Keyboarding Skills Objectives
Students will:

1407.2.2 Apply information processing concepts.
1407.2.3 Correctly manipulate document formatting tools.
1407.2.4 Master operation of the alphabet, punctuation, number, and symbol keys by touch.
1407.2.5 Exhibit proofreading skills by visually checking for errors utilizing the manual method or computer proofreading tools (i.e., spell check, grammar check, thesaurus.)
1407.2.6 Increase keyboarding speed and accuracy.

Standard 3: Basic Production Skills (1407.S.3)
Apply basic production skills.

Basic Production Skill Objectives
Students will:

1407.3.1 Develop language arts skills through composition at the keyboard utilizing capitalization, punctuation, and word division rules, number usage and spelling.
1407.3.2 Using correct grammar, key simple business/personal communications in error free form.
1407.3.3 Demonstrate basic production and editing skills in keyboarding and formatting copy for short reports, simple tables, memorandums, personal/business communications from arranged, rough-draft, handwritten, incomplete or unedited copy.
1407.3.4 Illustrate basic formatting skills on enumeration and outlines.
1407.3.5 Identify and correctly use proofreader's marks.
1407.3.6 Apply horizontal and vertical centering to text.
1407.3.7 Maintain a minimum speed of 40 words per minute with no more than three errors on a three-minute timed writing.
1407.3.8 Prepare envelopes using USPS style and insert correctly folded letters.
1407.3.9 Practice problem solving and decision-making skills.

Standard 5: Federal Reserve System (1405.S.5)
Analyze the Federal Reserve System and monetary policy.

Federal Reserve System Objectives
Students will:

1405.5.1 Define Federal Reserve System
1405.5.2 Describe the responsibilities of the Federal Reserve System
1405.5.3 Define monetary policy
1405.5.4 Locate the Federal Reserve banks and branches on a US map
1405.5.5 Differentiate between the U.S. Mint and the U.S. Bureau of Engraving
1405.5.6 Explain banks use of magnetic ink character recognition and electronic funds transfer

Banking and Finance

This course will help maximize a student's earning potential, develop strategies for managing financial resources, and gain insight into different methods of investing.

Standard 1: Careers in Banking and Finance (1405.S.1)
Explain banking and finance traits.

Banking and Finance Career Objectives
Students will:
1405.1.1 Use appropriate terminology
1405.1.2 Maintain ethical character traits, such as honesty, integrity, compassion, respect, responsibility citizenship and justice.

Standard 2: Budgets (1405.S.2)
Identify the need for and develop a budget.

Budgeting Objectives
Students will:
1405.2.1 Compare and contrast lifestyles and effects on a budget
1405.2.2 Identify steps in planning a budget
1405.2.3 Develop a budget based on goals, income, expenses, and savings
1405.2.4 Enumerate problems incurred without a budget

Standard 3: Saving and Investing (1405.S.3)
Differentiate between saving and investing.

Saving and Investing Objectives
Students will:
1405.3.1 Enumerate reasons for saving
1405.3.2 Describe differences between saving and investing
1405.3.4 List guidelines for investing
1405.3.5 Identify common choices for investing
1405.3.6 Explain uses of technology in the investment industry
1405.3.7 Determine opportune times for investing
1405.3.8 Interpret stock quotations
1405.3.9 Complete mock stock purchases
1405.3.10 Compute net gain/loss

Standard 4: Banking (1405.S.4)
Explain functions of banks and regulations of the banking industry.

Banking Objectives
Students will:
1405.4.1 Describe functions and characteristics of money
1405.4.2 Identify the source of value to the US Dollar and its area of storage
1405.4.3 Explain main functions of banks
1405.4.4 Identify government regulations of the banking industry
1405.4.5 Compute simple & compound interest
1405.4.6 Explain importance of maintaining confidentiality
1405.4.7 Write checks, maintain a checkbook balance, and compute a bank reconciliation statement

Standard 3: Specialized Accounting Procedures (1403.S.3)
Utilize specialized accounting procedures and applications.

Specialized Accounting Procedures Objectives
Students will:

1403.3.1 Implement procedures for departmental or branch accounting systems.
1403.3.2 Analyze and implement various methods for budgetary planning and control.
1403.3.3 Analyze and implement cost accounting procedures for manufacturing accounting.
1403.3.4 Analyze financial statements for a manufacturing concern to make cost decisions.
1403.3.5 Examine accounting issues faced by different types of industries such as services, manufacturing, and distribution.
1403.3.6 Analyze income statements and balance sheets for a business.
1403.3.7 Differentiate between the three basic types of businesses (services, merchandising and manufacturing).
1403.3.8 Interpret the differences between sole proprietorships, partnerships, and corporations
1403.3.9 Understand the accounting principles for not-for-profit and government entities.
1403.3.10 Demonstrate an understanding between personal and business taxation at various levels.

Accounting Principles II

This course provides students the opportunity to develop advanced knowledge of accounting procedures and techniques utilized in problem solving and in making financial decisions and analysis. Students study the advanced principles, concepts and practices of the accounting cycle that includes financial statements, banking, payroll, partnerships, corporation, cost accounting, inventory, and tax accounting.

Standard 1: Accounting Procedures (1403.S.1)
Demonstrate accounting procedures.

Accounting Procedures Objectives
Students will:

1403.1.1 Use accounting terminology.
1403.1.2 Understand and maintain ethical standards in the preparation of financial statements.
1403.1.3 Interpret characteristics of professional conduct.
1403.1.4 Use specialized accounting software, or spreadsheets, to maintain accounting procedures.
1403.1.5 Demonstrate competence in the structure and sequence of the accounting cycle utilizing manual and automated systems.
1403.1.6 Analyze computer generated reports.

Standard 2: Accounting Procedures for Assets, Liabilities, and Equity (1403.S.2)
Implement accounting procedures for assets, liabilities, and equity.

Assets, Liabilities, and Equity Procedures Objectives
Students will:

1403.2.1 Analyze cash and accounts receivable transactions and record in appropriate journals.
1403.2.2 Analyze investment transactions and record in appropriate journals.
1403.2.3 Calculate inventories using various methods and record in appropriate journals.
1403.2.4 Analyze plant and intangible asset transactions and record in appropriate journals.
1403.2.4 Analyze current liabilities transactions and record in appropriate journals.
1403.2.5 Analyze long-term liabilities transactions and record in appropriate journals.
1403.2.6 Analyze equity transactions for various forms of business ownership and record in appropriate journals.
1403.2.7 Generate financial and end-of-period statements.
1403.2.8 Analyze and interpret financial statements.
1403.2.9 Update accounts through adjusting and closing entries.
1403.2.10 Explain and record adjusting and reversing entries for accrued revenue and expenses.
1403.2.11 Complete account procedures for prepaid expenses and unearned revenue.
1403.2.12 Analyze, compute and record transactions related to uncollectible accounts.
1403.2.13 Manage the computations and recordings of transactions related to notes receivable and notes payable.
1403.2.14 Identify concepts and practices related to accounting for plant assets.
1403.2.15 Calculate and record depreciation of plant assets.
1403.2.16 Analyze the concept of cash flow management.

1401.4.3 Compute gross earnings, deductions and net pay for an employee.
1401.4.4 Record and post transactions associated with payroll activities.
1401.4.5 Create and maintain employee earnings records.
1401.4.6 Demonstrate generation of payroll checks.
1401.4.7 Demonstrate the ability to write business checks and complete check stubs and check registers.
1401.4.8 Demonstrate the ability to prepare bank deposits slips.
1401.4.9 Identify and demonstrate the three types of check endorsements.
1401.4.10 Reconcile a bank statement, prepare journal entries, and post.
1401.4.11 Demonstrate an understanding for replenishing of and preparing journal entries for the petty cash fund.

Accounting Principles I

This course prepares students with the basic principles of the accounting cycle. Students study the basic principles, concepts and practices of the accounting cycle which includes financial statements, banking, payroll, business ownerships and an accounting career orientation.

Standard 1: Accounting Careers (1401.S.1)
Investigate accounting as a career.

Career Objectives
Students will:
1401.1.1 Define the purpose of accounting and the role it plays in our economy.
1401.1.2 Use appropriate accounting terminology.
1401.1.3 Discuss entry-level accounting positions and their education requirements.
1401.1.4 Identify confidentiality concepts and policies.
1401.1.5 Identify characteristics of professional and ethical conduct.

Standard 2: Accounting Cycle (1401.S.2)
Analyze accounting procedures, as applied to the accounting cycle.

Procedures Objectives
Students will:
1401.2.1 Demonstrate the effects of transactions on the accounting equation.
1401.2.2 Identify and use source documents.
1401.2.3 Prepare a chart of accounts using proper numerical sequencing.
1401.2.4 Demonstrate the purpose of a general journal and how it relates to a ledger.
1401.2.5 Post general journal entries to the general ledger and update the account balances.
1401.2.6 Prepare a trial balance.
1401.2.7 Prepare/create financial statements.
1401.2.8 Calculate and record end-of-period adjustments.
1401.2.9 Prepare post-closing trial balance.
1401.2.10 Use specialized accounting software, or spreadsheets, to maintain accounting records.
1401.2.11 Identify the differences between computerized and manual accounting procedures.

Standard 3: The Accounting Cycle for Specialized Procedures (1401.S.3)
Students will implement specialized accounting procedures as applied to the accounting cycle.

The Accounting Cycle Objectives
Students will:
1401.3.1 Differentiate between the different types of business ownerships.
1401.3.2 Differentiate between a service and a merchandising business.
1401.3.3. Analyze transactions relating to the purchase of merchandise and record in special journals.
1401.3.4 Analyze transactions relating to sale of merchandise and record in special journals.
1401.3.5 Analyze financial statements.

Standard 4: Payroll and Banking Procedures (1401.S.4)
Analyze payroll and banking procedures.

Payroll and Banking Procedures Objectives
Students will:
1401.4.1 Define methods used to determine gross earnings.
1401.4.2 Explain the purpose of deductions and withholdings.

0217.4.5 Describe the use of biological controls in integrated pest management.
0217.4.6 Calculate pesticide application rates.
0217.4.7 Describe safe chemical handling and safety equipment.
0217.4.8 Identify controls for large pests.

Standard 5: Equipment and Safety (0217.S.5)
Students will practice and demonstrate safety with turf tools, equipment, and activities.

Equipment and Safety Objectives
Students will:
0217.5.1 Identify principles of equipment and personal safety.
0217.5.2 Demonstrate ability to operate turf equipment.
0217.5.3 Explain basic equipment maintenance.
0217.5.4 Identify correct mower sharpening procedures.

Standard 6: Developing Work-Based Experiential Program (SAE) (0217.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0217.6.1 Explore opportunities for Supervised Agricultural Experience Programs.
0217.6.2 Establish a Supervised Agricultural Experience Program in grounds maintenance.
0217.6.3 Maintain records of experience program activities, expenses and earnings.

Turf Management

This area of study is designed to provide students with scientific concepts and skills necessary to properly analyze problems in the turf management industry. Major concepts include pest management, cultural practices and scientific methods of evaluating turf problems.

Standard 1: Leadership and Communication Development (0217.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0217.1.1 Describe FFA.
0217.1.2 Identify appropriate career opportunities in the turfgrass industry.
0217.1.3 Prepare a resume', complete a job application, and demonstrate job seek/keep skills.
0217.1.4 Develop personal relations communication skills.
0217.1.5 Identify career opportunities in turf management.
0217.1.6 Identify income potential in turf management.

Standard 2: Growth and Physiology (0217.S.2)
Students will describe the process of plant growth.

Growth and Physiology Objectives
Students will:
0217.2.1 Identify major plant parts.
0217.2.2 Identify adaptation zones.
0217.2.3 Identify warm and cool season species of turfgrass.
0217.2.4 Identify turf growth patterns.

Standard 3: Cultural Practices (0217.S.3)
Students will demonstrate practices pertaining to the establishment and maintenance of turfgrass.

Cultural Practices Objectives
Students will:
0217.3.1 Identify appropriate mowing techniques for given areas.
0217.3.2 Describe the 1/3 rule.
0217.3.3 Explain soil-sampling procedures.
0217.3.4 Identify soil testing techniques and procedures.
0217.3.5 Calculate fertilizer application rates.
0217.3.6 Explain fertilizer application techniques.
0217.3.7 Explain the two major irrigation techniques.
0217.3.8 Calculate irrigation rates.
0217.3.9 Identify verticutting, rolling, top dressing and aeration.
0217.3.10 Explain turf establishment procedures.

Standard 4: Pest Management (0217.S.4)
Students will demonstrate safe pesticide use and describe the concept of integrated pest management.

Pest Management Objectives
Students will:
0217.4.1 Identify common turf insects.
0217.4.2 Identify common turf weeds.
0217.4.3 Identify common turf diseases.
0217.4.4 Identify control practices for pests.

Standard 4: Consumer Law (1417.S.4)
Analyze consumer law.

Consumer Law Objectives
Students will:

1417.4.1 Identify legislation that regulates consumer credit, such as Fair Credit Reporting Act, Fair Credit Billing Act, Equal Credit Opportunity Act, Fair Credit Collection Practices Act, Consumer Credit Protection Act and E-Commerce.
1417.4.2 Discuss consumer protection legislation, such as the Federal Trade Commission Act, the Consumer Product Safety Act, and the Consumer Leasing Act.
1417.4.3 Explain the importance of the Uniform Commercial Code (UCC) as it relates to the consumer.
1417.4.4 Identify various types of warranties and describe how each of the warranties may be excluded or modified.
1417.4.5 Describe and discuss the various aspects of bankruptcy, such as Liquidation, Reorganization, and Reorganization of Debts.

Standard 5: Real and Personal Property (1417.S.5)
Explain legal rules that apply to real and personal property.

Real and Personal Property Objectives
Students will:

1417.5.1 Distinguish among liens, licenses, and easements and explain the differences.
1417.5.2 List the major estates in land and describe the major features of each.
1417.5.3 List and describe the forms of co-ownership of real property.
1417.5.4 Illustrate the methods of transferring title (deeding) to real and personal property.
1417.5.5 Describe the kinds of rental relationships that landlords and tenants may create.
1417.5.6 Recognize the advantages and disadvantages of financing/leasing a car.
1417.5.7 Describe the principal kinds of automobile insurance.
1417.5.8 Name and describe the principal types of bailments.
1417.5.9 Contrast the rights and duties in bailments.
1417.5.10 Compare the law of patents, copyrights, and trademarks.

Standard 6: Employment Law (1417.S.6)
Analyze employment law.

Employment Law Objectives
Students will:

1417.6.1 Describe the employer-employee relationship and the rights and duties of each.
1417.6.2 Explain the doctrine of employment-at-will and describe the wrongful discharge exceptions to employment-at-will.
1417.6.3 Describe the collective bargaining process and other union activities.
1417.6.4 List and explain major legislation affecting the employer-employee relationship.
1417.6.5 Explain the relationship of Title VII of the Civil Rights Act to employment.

Standard 7: Personal Law (1417.S.7)
Analyze legal rules that apply to domestic situations.

Personal Law Objectives
Students will:

1417.7.1 Understand the rights and responsibilities of minors.
1417.7.2 Explain the relationship between school and minors.
1417.7.3 Explain marriage contracts.
1417.7.4 Distinguish between legal rights and obligations of marriage

1417.7.5 Describe the legal aspects of parenthood.
1417.7.6 Discuss considerations for termination of a marriage.
1417.7.7 Understand the legal ramifications of death.

Business Math

Business math prepares students for using mathematical skills as related to business.

Standard 1: Computation Skills (1419.S.1)
Develop computational skills needed to solve business and consumer problems.

Computation Skills Objectives (Business Problems and Consumer Problems)
Students will:

1419.1.1 Solve problems that involve whole numbers, decimals, and fractions.
1419.1.2 Solve problems that involve percents, ratios, and proportions.
1419.1.3 Interpret tables, charts, and graphs.

Standard 2: Analyze and Solve Business Problems (1419.S.2)
Analyze and solve business problems for such areas as payroll records, taxation, personal cash management, credit management, depreciation, inventory records, purchases, sales, and financial statements.

Analyze and Solve a variety of Business Problems Objectives
Students will:

1419.2.1 Calculate earnings using different wage plans.
1419.2.2 Determine payroll deductions and compute net pay.
1419.2.3 Complete a signature card, deposit slip, maintain checkbook and prepare reconciliation statement.
1419.2.4 Identify the types of savings and checking accounts currently available.
1419.2.5 Identify and state how certified checks and cashier's checks are used.
1419.2.6 List the types of endorsements and state when to use them.
1419.2.7 Prepare a budget for personal money management.
1419.2.8 Compute individual income taxes.
1419.2.9 Identify an installment contract and a promissory note and calculate interest and maturity value.
1419.2.10 Determine the balance due for installment purchases.
1419.2.11 Determine finance/additional charges, periodic payment, total cost, and the Annual Percentage Rate (APR) on an installment contract.
1419.2.12 Identify purchase cost, salvage value, useful life, depreciation base, and book value.
1419.2.13 Compute depreciation by the following methods: straight-line, sum-of-the-years-digits, declining balance, and unit-of-production.
1419.2.14 Compute a physical inventory value by using FIFO, LIFO, specific identification and average cost methods.
1419.2.15 Compute the net profit or loss.
1419.2.16 Determine the dollar amount of cost, markup, or sales price when one of the three variables is unknown.
1419.2.17 Determine the dollar amount of markdowns, regular selling price, or reduced price when one of the three variables is unknown.
1419.2.18 Complete a sales invoice with sales information and sales tax.
1419.2.19 Identify each element of the fundamental accounting equation. (Assets = Liabilities + Owner's Equity)
1419.2.20 State and describe the debit and credit theory.
1419.2.21 Interpret a balance sheet and income statement.
1419.2.22 Distribute partnership income (revenue) or loss by different methods.
1419.2.23 Calculate commissions.
1419.2.24 Calculate insurance premiums.
1419.2.25 Examine differences between term and whole life insurance policies.

Business Recordkeeping

This course prepares the student with entry level skills which enable them to process business forms and financial records.

Standard 1: Careers in Personal Recordkeeping (1421.S.1)
Analyze personal recordkeeping as a career.

Personal Recordkeeping Career Objectives
Students will:
1421.1.1 Define the purpose of personal record keeping and the role it plays in our economy.
1421.1.2 Use appropriate personal record keeping terminology.
1421.1.3 Research entry-level personal record keeping positions and their educational requirements.
1421.1.4 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship and justice.

Standard 2: Personal Recordkeeping Practices (1421.S.2)
Demonstrate personal recordkeeping practices.

Personal Recordkeeping Practices Objectives
Students will:
1421.2.1 Enter and correct data on business forms.
1421.2.2 Verify data processing computer output.
1421.2.3 Demonstrate a numeric filing system.
1421.2.4 Demonstrate an alphabetic filing system.
1421.2.5 Identify the differences between computerized and manual data processing procedures.
1421.2.6 Compare and demonstrate the differences between personal, family, and business budgets.
1421.2.7 Identify the purposes and procedures in handling credit/loan functions.

Standard 3: Monetary Funds (1421.S.3)
Demonstrate the handling of monetary funds.

Handling Monetary Funds Objectives
Students will:
1421.3.1 Prepare a proof of cash.
1421.3.2 Demonstrate how to give correct change.
1421.3.3 Demonstrate the ability to properly record cash receipt transactions.

Standard 4: Banking Procedures (1421.S.4)
Develop banking procedures.

Banking Procedures Objectives
Students will:
1421.4.1 Demonstrate the ability to write business checks and complete check stubs and check registers.
1421.4.2 Demonstrate the ability to prepare bank deposits slips.
1421.4.3 Identify and demonstrate the three types of check endorsements.
1421.4.4 Prepare a bank reconciliation statement.

Standard 5: Petty Cash Records (1421.S.5)
Prepare petty cash records.

Petty Cash Objectives
Students will:
1421.5.1 Prepare a petty cash voucher and attach receipts.
1421.5.2 Record in the petty cash book business expenses, cash shortages and overages, and replenishment of the petty cash fund.

Standard 6: Payroll Procedures (1421.S.6)
Demonstrate payroll procedures.

Payroll Procedures Objectives
Students will:
1421.6.1 Demonstrate procedures used to determine gross earnings.
1421.6.2 Compute gross earnings, deductions, and net pay for an employee and record them on the payroll register.
1421.6.3 Record payroll information into individual earning records.
1421.6.4 Prepare tax and payroll deduction forms.

Standard 7: Daily Business Forms (1421.S.7)
Prepare and use daily business forms.

Daily Business Forms Objectives
Students will:
1421.7.1 Prepare sales slips.
1421.7.2 Prepare statements of account.
1421.7.3 Prepare purchase requisitions.
1421.7.4 Prepare purchase orders.
1421.7.5 Prepare invoices.

Standard 8: Accounting Forms (1421.S.8)
Prepare and use accounting forms.

Basic Accounting Forms Objectives
Students will:
1421.8.1 Prepare a purchase journal.
1421.8.2 Prepare accounts payable and accounts receivable ledgers.
1421.8.3 Prepare a cash payments journal.
1421.8.4 Prepare a cash receipts journal.
1421.8.5 Prepare a general journal.

Computerized Presentations

This area of study is designed to develop intermediate/advanced-level skills utilizing presentation software. Students will achieve proficiency and expert level skills and will have the opportunity to receive specialized certification by taking an examination. This is a one-semester course.

Standard 1: Presentation Development (1423.S.1)
Create a presentation.

Presentation Development Objectives
Students will:
1423.1.1 Create from a template.
1423.1.2 Create from an existing presentation.
1423.1.3 Delete slides.

Standard 2: Textual (1423.S.2)
Add textual information to presentations.

Textual Objectives
Students will:
1423.2.1 Enter text in a slide and outline view.
1423.2.2 Enter bulleted information.
1423.2.3 Change the text alignment.

Standard 3: Visual Elements (1423.S.3)
Add visual elements to presentations.

Visual Element Objectives
Students will:
1423.3.1 Add formatting.
1423.3.2 Build a graph.
1423.3.3 Draw an object.
1423.3.4 Rotate and fill an object.
1423.3.5 Scale and size an object.
1423.3.6 Add a table.
1423.3.7 Add shapes.
1423.3.8 Animate objects.
1423.3.9 Add transitions.
1423.3.10 Add an organization chart.
1423.3.11 Set custom options.
1423.3.12 Check styles.

Standard 4: Customizing Presentations (1423.S.4)
Customize presentations by bringing in data from other resources.

Customize Presentation Objectives
Students will:
1423.4.1 Add clip art.
1423.4.2 Insert an Excel chart.
1423.4.3 Import text from Word.
1423.4.4 Add scanned images.
1423.4.5 Add sound and movie.
1423.4.6 Export an outline to Word.

Standard 5: Modifying Presentations (1423.S.5)
Modify a presentation.

Modifying Presentation Objectives
Students will:
1423.5.1 Change the sequence of a slide.
1423.5.2 Find and replace text.
1423.5.3 Modify the slide master.
1423.5.4 Modify sequence in outline mode.
1423.5.5 Change tabs.
1423.5.6 Change fonts.
1423.5.7 Change the alignment of text.

Standard 6: Distribution (1423.S.6)
Prepare for distribution.

Distribution Objectives
Students will:
1423.6.1 Use spelling and grammar check.
1423.6.2 Add speaker notes.
1423.6.3 Set automatic slide timing.

Standard 7: Enhancing Presentations (1423.S.7)
Customize a presentation.

Enhancing Presentation Objectives
Students will:
1423.7.1 Create a custom background.
1423.7.2 Customize a color scheme.
1423.7.3 Customize clip art and other objects.
1423.7.4 Recolor and edit objects.
1423.7.5 Apply a template from another presentation.
1423.7.6 Add links to other slides within the presentation.
1423.7.8 Hide slides.

Standard 8: Presentation Delivery (1423.S.8)
Deliver presentations.

Presentation Delivery Objectives
Students will:
1423.8.1 Start a slide show on any slide.
1423.8.2 Use on screen navigation tools.
1423.8.3 Generate meeting notes
1423.8.4 Electronically incorporate meeting features.
1423.8.5 Print slides in a variety of formats.
1423.8.6 Print color presentations.
1423.8.7 Export to overhead.
1423.8.8 Export to 35mm slides.
1423.8.9 Present with presentation conferencing.
1423.8.10 Save presentation for use on another computer.
1423.8.11 Save for Internet use.

Cooperative Office Education

Cooperative Office Education is an on-the-job training for students that contributes to the over-all instructional program. The instruction, through written agreement between school and employers, is a combination of study in school with employment in the appropriate field. The related classroom instruction and on-the-job experiences are planned and supervised by employers and teacher coordinators to complete the student's education as to his/her career objective.

Standard 1: Human Relations Skills (1425.S.1)
Demonstrate human relations skills required for success in the workplace.

Human Relations Skills Objectives
Students will:
1425.1.1 Demonstrate honesty and integrity.
1425.1.2 Use proper business ethics in all business activities.
1425.1.3 Demonstrate respect for customers, co-workers, and management.
1425.1.4 Demonstrate initiative in completing job duties.
1425.1.5 Maintain a positive attitude and positive relationship with customers, co-workers, and management.
1425.1.6 Adapt to changes in job responsibilities.
1425.1.7 Appreciate diversity in the workplace.
1425.1.8 Exhibit self-control when working with customers, co-workers and management.
1425.1.9 Use appropriate assertiveness.
1425.1.10 Exhibit empathy for customers, co-workers and management.
1425.1.11 Use feedback from others for personal growth.
1425.1.12 Practice proper business etiquette.
1425.1.13 Identify procedures to respond to sexual harassment.

Standard 2: Business Communications (1425.S.2)
Demonstrate appropriate business communication skills.

Communications Objectives
Students will:
1425.2.1 Use correct grammar and vocabulary in written and oral communications.
1425.2.2 Listen to and follow directions.
1425.2.3 Explain policies and procedures to customers and clients.
1425.2.4 Perform proper telephone techniques appropriately.
1425.2.5 Demonstrate the proper procedure for job termination.

Standard 3: Basic Work Skills (1425.S.3)
Demonstrate mastery of basic work skills for a chosen occupation.

Basic Work Skills Objectives
Students will:
1425.3.1 Maintain punctuality, appropriate attendance, and dependability.
1425.3.2 Work independently without direct supervision.
1425.3.3 Stay with an assigned task until successful completion.
1425.3.4 Utilize time management principles when completing assignments.
1425.3.5 Apply organizational skills in daily activities.
1425.3.6 Participate as a team member when completing a work project.
1425.3.7 Produce quality work.
1425.3.8 Accept accountability for one=s performance.

1425.3.9 Perform basic mathematical functions.
1425.3.10 Operate the most common electronic equipment with speed and accuracy.
1425.3.11 Maintain appropriate records for use on the job and in class.
1425.3.12 Demonstrate leadership skills when completing a project or task.
1425.3.13 Exhibit decision-making skills.
1425.3.14 Solve problems individually and as a team member.
1425.3.15 Participate in company meetings and activities.

Standard 4: Basic Safety Techniques (1425.S.4)
Apply and demonstrate basic safety techniques.

Basic Safety Techniques Objectives
Students will:
1425.4.1 Practice basic safety rules.
1425.4.2 Handle company equipment properly and safely.
1425.4.3 Demonstrate safety procedures for handling and lifting heavy materials.
1425.4.4 Follow procedures in the case of an accident, including reporting procedures.
1425.4.5 Follow security procedures.
1425.4.6 Practice proper safety procedures for handling and storing hazardous materials.
1425.4.7 Recognize and report hazardous conditions.
1425.4.8 Read and interpret operating instructions before using equipment.
1425.4.9 Explain and practice procedures for safe evacuation.
1425.4.10 Identify A, B, and C fires and how to extinguish them.
1425.4.11 Identify proper agencies for safety procedures (fire department, police department, OSHA, hospital).

Database Management

This area of study is designed to develop skills in database application software. Students will achieve proficiency and expert level skills and will have the opportunity to receive a specialized certification. (One semester class)

Standard 1: Create Databases (1427.S.1)
Create databases.

Create Database Objectives
Students will:
1427.1.1 Plan a database.
1427.1.2 Create a table.
1427.1.3 Enter data into a table.
1427.1.4 Modify data in a table.
1427.1.5 Enter data into a form.
1427.1.6 Navigate through a table.
1427.1.7 Delete data from a table.

Standard 2: Forms (1427.S.2)
Create and utilize forms.

Create Form Objectives
Students will:
1427.2.1 Create a simple form.
1427.2.2 Modify a form.
1427.2.3 Create controls on a form.
1427.2.4 Modify controls.
1427.2.5 Add a record using a form.
1427.2.6 Show related records on a form.

Standard 3: Modify databases (1427.S.3)
Modify pre-created databases.

Database Modification Objectives
Students will:
1427.3.1 Open a database.
1427.3.2 Modify field properties.
1427.3.3 Modify field layout.
1427.3.4 Modify the presentation of a database.

Standard 4: View Information (1427.S.4)
Utilize view techniques.

View Information Objectives
Students will:
1427.4.1 Present information in chart.
1427.4.2 View information in a form.
1427.4.3 View multiple records.
1427.4.2 Switch between views.

Standard 5: Organize Information (1427.S.5)
Organize data information in single and multiple fields

Organize Data Fields Objectives
Students will:
1427.5.1 Sort data on single fields.
1427.5.2 Sort data on multiple fields.

Standard 6: Locate Information (1427.S.6)
Locate records and work with queries.

Record and Query Objectives
Students will:
1427.6.1 Find a specific record.
1427.6.2 Create a simple query.
1427.6.3 Create a query with multiple criteria.
1427.6.4 Add filters (selection and form).
1427.6.5 Remove filters.

Standard 7: Refine Results of a Query (1427.S.7)
Refine query results by adding, removing, sorting, joining and removing tables.

Refine Query Objectives
Students will:
1427.7.1 Add fields to a query.
1427.7.2 Remove fields from a query.
1427.7.3 Sort a query.
1427.7.4 Join tables in a query.
1427.7.5 Remove joins in a query.
1427.7.6 Save a query.

Standard 8: Analyze Data (1427.S.8)
Analyze data.

Analyze Data Objectives
Students will:
1427.8.1 Build summary queries.
1427.8.2 Calculate fields.
1427.8.3 Set crosstab queries.

Standard 9: Create Sub Forms (1427.S.9)
Create sub forms by adding records and merging tables.

Create Sub Form Objectives
Students will:
1427.9.1 Identify appropriate use for sub forms.
1427.9.2 Add a record with a main form.
1427.9.3 Add records with sub forms.
1427.9.4 Merge two tables into a form.

Standard 10: Building a Relational Database (1427.S.10)
Build relational databases.

Relational Database Objectives
Students will:
1427.10.1 Identify relationships.

1427.10.2 Relate tables.

Standard 11: Integrate Applications (1427.S.11)
Integrate information from other applications.

Application Integration Objectives
Students will:
1427.11.1 Import data.
1427.11.2 Link data.
1427.11.3 Add pictures to records.

Standard 12: Utilize Web Capability (1427.S.12)
Utilize the web for hyperlinks and building forms.

Web Capability Objectives
Students will:
1427.12.1 Create hyperlinks.
1427.12.2 Build order forms for Internet use.

Standard 13: Maintain Data Integrity (1427.S.13)
Maintain data integrity.

Data Integrity Objectives
Students will:
1427.13.1 Identify criteria for data integrity.
1427.13.2 Validate text.
1427.13.3 Set required properties.
1427.13.4 Set validation rules.
1427.13.5 Set look up fields.
1427.13.6 Use expressions in calculated controls.

Standard 14: Build Forms for Other Users (1427.S.14)
Create and modify forms.

Building Form Objectives
Students will:
1427.14.1 Title a form.
1427.14.2 Modify form design.
1427.14.3 Improve accuracy in a form.
1427.14.4 Enhance design of a form.

Standard 15: Produce Reports (1427.S.15)
Create, label, modify, and manipulate data in reports.

Producing Reports Objectives
Students will:
1427.15.1 Create a report.
1427.15.2 Modify a report.
1427.15.3 Label a report.
1427.15.4 Customize headers and footers.
1427.15.5 Make a calculation on a report.
1427.15.6 Group data in a report.
1427.15.7 Sort data in a report.
1427.15.8 Add custom pages.

Standard 16: Print. (1427.S.16)
Print forms, queries and reports.

Print Objectives
Students will:
1427.16.1 Print a report.
1427.16.2 Print a form.
1427.16.3 Print the result of a query.

Desktop Publishing

This course will introduce students to a variety of ways that people use tools and resources to communicate. Students will explore various applications in desktop publishing through hands-on activities and experiences which may include brochures, pamphlets, newsletters, letterheads, tables (graphs, charts, etc.), memo forms, advertisements, banners, business cards, web pages, etc.

Standard 1: Basic Desktop Publishing Concepts (1429.S.1)
Identify desktop publishing concepts.

Basic Desktop Publishing Concepts Objectives
Students will:

1429.1.1 Define and use desktop publishing terminology.
1429.1.2 Identify desktop publishing concepts, i.e. audience appeal, design, layout, and marketing.
1429.1.3 Review and practice basic word processing skills, i.e. mouse, opening, editing, formatting, saving, printing.
1429.1.4 Identify and analyze desktop publishing career opportunities.

Standard 2: Desktop Software (1429.S.2)
Demonstrate skills utilizing desktop software.

Utilizing Desktop Software Objectives
Students will:

1429.2.1 Define publication software, start the program, view the publication software window, open and save a publication, enter text in a frame, view and print a publication and exit the program.
1429.2.2 Plan and design a publication, create a publication with the Wizard, replace frame text, import a graphic and text, import an object from a drawing program (Paintbrush), add a sidebar, add a pull quote, use the Wizard tools, and group/ ungroup objects.
1429.2.3 Use layout guides, use ruler guides, work with a frame, add bullets and numbering, check spelling, use graphics (clip art folder), paint formats, and add a table.
1429.2.4 Insert and resize clip art, copy and move an object, crop an image, align and group images, layer objects, rotate art, use drawing tools, and fill drawn shapes.
1429.2.5 Define styles, modify and apply a style, change a format into a style, create columns, adjust text overflows, add >Continued on/from= notices, add drop caps, and create reversed text.
1429.2.6 Add a page, delete a page, work with a background, create a header and footer, add page numbers, work with stories, use tabs, and create a booklet.
1429.2.7 Add border art, create an object shadow, design word art, create a bleed, create a watermark, wrap text around a frame, rotate a text frame, create a Web page.
1429.2.8 Use a digital camera and a scanner to import visuals into publications.

Standard 3: Legal and Ethical (1429.S.3)
Determine legal and ethical aspects of desktop publishing.

Legal and Ethical Objectives
Students will:

1429.3.1 Identify copyright and patent laws pertaining to scanned images and documents, electronic clip art, scanned photography, trademarks, and information (graphics and text) downloaded from the Internet.
1429.3.2 Identify licensing agreements associated with desktop publishing software.

Digital Imaging/Mutimedia

This course will introduce students to the basics of producing digital images for multimedia purposes. Students will explore various methods of producing images through hands-on activities and experiences which will include: operating a digital camera and a scanner, using imaging software to improve photos or to create special effects, creating simple animations, manipulating video images, and producing multimedia images.

Standard 1: Basic Computer Concepts (1431.S.1)
Identify basic computer concepts

Basic Computer Concepts Objectives
Students will:
1431.1.1 Define and use digital imaging terminology
1431.1.2 Explore careers requiring digital imaging skills
1431.1.3 Explore basic concept of Web navigation

Standard 2: Digital Cameras
Operate digital cameras

Digital Cameras Operation Objectives
Students will:
1431.2.1 Identify features of different types of digital cameras
1431.2.2 Take pictures and transfer images to the computer using different types of digital cameras
1431.2.3 Manipulate and organize images transferred from digital cameras

Standard 3: Operate Scanner
Operate scanners.

Scanner Operations Objectives
Students will:
1431.3.1 Identify different types of scanners and scanning software programs
1431.3.2 Scan images using different types of scanners and software programs
1431.3.3 Transfer images to computer software.

Standard 4: Utilizing Imaging Software
Utilize imaging software.

Imaging Software Objectives
Students will:
1431.4.1 Identify different types of imaging software
1431.4.2 Identify different types of file formats
1431.4.3 Produce digital photographs
1431.4.4 Understand layers and create photos using layers
1431.4.5 Incorporate color techniques and enhance images
1431.4.6 Add type to an image
1431.4.7 Create special effects with filters
1431.4.8 Create multimedia photos

Standard 5: Create Animations (1431.S.5)
Create animations.

Create Animations Objectives
Students will:
1431.5.1 Identify animation software
1431.5.2 Place images to create animations
1431.5.3 Create frames from images to animate
1431.5.4 Enhance animations
1431.5.5 Create multimedia animations

Standard 6: Digital Video Images (1431.6)
Create and manipulate digital video images.

Digital Video Images Objectives
Students will:
1431.6.1 Identify features and operate video digital camera
1431.6.2 Use digital video software to cut, edit, apply effects and transitions to video clips
1431.6.3 Create multimedia video clips

Standard 7: Computer Generated Drawings (1431.S.7)
Create computer generated drawings.

Computer Created Generated Drawings Objectives
Students will:
1431.7.1 Identify different types of computer drawing software
1431.7.2 Identify and use major components of a drawing program
1431.7.3 Create graphics for multimedia uses; such as buttons and banners for Web pages, letterheads, business cards, flyers

Standard 8: Legal and Ethical Imaging (1431.S.8)
Analyze legal and ethical aspects of creating digital images.

Legal and Ethical Aspects of Creating Digital Images Objectives
Students will:
1431.8.1 Identify and understand the concepts of plagiarism and copyright violations
1431.8.2 Discuss ethical and unethical behavior when producing digital images
1431.8.3 Discuss laws related to production and distribution of digital images
1431.8.4 Identify the legal issues related to the production and distribution of digital images

Document (Word) Processing

This course will provide students the opportunity to obtain life-long document processing skills through hands-on learning situations utilizing a variety of software functions. Classroom experiences also provide for skill development in visual and oral communication.

Standard 1: Basic Concepts and Office Operations (1433.S.1)
Acquire basic concepts and office operations procedures.

Basic Concepts and Office Procedural Operations Objectives
Students will:

1433.1.1 Load, access and exit operating system and software.
1433.1.2 Use file and disk management procedures such as deleting, copying, backing up files, and formatting disks.
1433.1.3 Develop work habits for maintenance of storage media and computer hardware.
1433.1.4 Define and use document (word) processing terminology.
1433.1.5 Demonstrate the utilization of different word processing software packages.
1433.1.6 Perform skills for each phase of the word processing cycle.
1433.1.7 Identify document processing supply needs.
1433.1.8 Use a software manual as a reference for finding solutions and learning software packages.
1433.1.9 Develop work habits and attitudes that will enhance future career endeavors.

Standard 2: Document Production (1433.S.2)
Produce error-free documents utilizing a variety of hardware and software.

Error-free Documents Utilizing a Variety of Hardware and Software Objective
Students will:

1433.2.1 Create documents representing a variety of formats such as letters, reports, tables and memos.
1433.2.2 Proofread (manually and electronically) complex business documents.
1433.2.3 Insert, delete, move, and copy text and data.
1433.2.4 Customize word processing software defaults.
1433.2.5 Troubleshoot a word processing problem by obtaining assistance from help screens and printed manuals.
1433.2.6 Create and execute macros.
1433.2.7 Sort data in ascending and descending order.
1433.2.8 Create and merge a primary file with a secondary file.
1433.2.9 Utilize on-screen forms and templates.
1433.2.10 Integrate spreadsheet, database, and word processing applications in documents.
1433.2.11 Use transfer skills to understand and compare different word processing software.
1433.2.12 Use rough draft handwritten sources to input material.
1433.2.13 Practice decision-making skills for document processing procedures and priorities.
1433.2.14 Compose and produce error-free documents.
1433.2.15 Recognize and use proofreader's marks.

Standard 3: Electronic Communications (1433.S.3)
Develop the skills necessary to communicate electronically.

Electronic Communications Objectives
Students will:

1433.3.1 Access data from news groups, home pages, and other online resources
1433.3.2 Upload and download electronic data.

1433.3.3 Identify emerging trends in document processing.

Standard 4: Career Employment Skills (1433.S.4)
Develop skills relating to career employment.

Career Employment Skills Objectives
Students will:
1433.4.1 Explore career options.
1433.4.2 Compose a letter of application.
1433.4.3 Create or update a resume.
1433.4.4 Compose an interview follow-up letter.

Economics of Business

This course focuses on the impact of economics as it relates to businesses and individuals. Because businesses are part of the overall economy, the success of any individual business is strongly affected by events in the economy as a whole. In addition, the economy as a whole is affected by the actions of the individual members within it.

Standard 1: Economic Principles (1435.S.1)
Describe the importance of economic principles in today's society.

Economic Principles in Today's Society Objectives
Students will:
1435.1.1 Identify opportunity costs and trade-offs involved in making choices about how to use scarce economic resources.
1435.1.2 Give examples of economic wants and needs.
1435.1.3 Identify the resources (factors of production) that are used to satisfy wants and needs.
1435.1.4 Define economic goods and services.
1435.1.5 Explain how the concept of scarcity affects the availability of economic goods and services.

Standard 2: Productivity, Specialization and Division of Labor Change (1435.S.2)
Explain the importance of productivity and discuss how specialization and division of labor change productivity.

Productivity, Specialization and Division of Labor Change Objectives
Students will:
1435.2.1 Analyze the methods of increasing productivity.
1435.2.2 Demonstrate specialization and division of labor.
1435.2.3 Explain how the relationship of input to output affects the level of productivity.

Standard 3: Basic Economic Systems Differences (1435.S.3)
Explain why societies develop economic systems and identify the basic features of different economic systems.

Basic Economic Systems Differences Objectives
Students will:
1435.3.1 Explain why a society needs an economic system.
1435.3.2 Discuss advantages and disadvantages of different types of economic systems.
1435.3.3 Discuss how an economic system addresses the questions what is to be produced, how it is to be produced, and for whom.

Standard 4: Role of Core U.S. Economic Institutions and Incentives (1435.S.4)
Explain the role of core economic institutions and incentives in the U.S. economy.

Core U.S. Economic Institutions and Incentives Objectives
Students will:
1435.4.1 Describe the concept of profit in the free enterprise system.
1435.4.2 Provide examples of economic institutions and incentives.
1435.4.3 Analyze reasons why a society's allocation of resources will be affected by its laws, public policy, and taxation.

Standard 5: Role of Exchange and Money (1435.S.5)
Explain the role of exchange and money in an economic system and describe the effect of interdependence on economic activity.

Role of Exchange and Money Objectives
Students will:
1435.5.1 Demonstrate the concept of barter.
1435.5.2 Explain why and illustrate how money can contribute to an increased number of exchanges, greater specialization and interdependence, and a higher standard of living in an economy.

Standard 6: Role of Supply and Demand as related to Markets and Prices in the U.S (1435.S.6)
Describe the role of law of supply and demand in the U.S. economy.

Role of Markets and Prices In the U.S. Economy Objectives
Students will:
1435.6.1 Define the concept of supply and demand.
1435.6.2 Analyze prices as determined by supply and demand.
1435.6.3 Identify determinants of supply and demand for goods and services.
1435.6.4 Describe how relative prices affect buying and selling decisions of producers and consumers.
1435.6.5 Graph the concept of price on a supply and demand curve.

Standard 7: Types of Competitive Structures and Markets (1435.S.7)
Describe different types of competitive structures and illustrate the role of competitive markets in the U.S. and other economies.

Types of Competitive Structures and Markets Objectives
Students will:
1435.7.1 Explain how competition among sellers affects prices and profits.
1435.7.2 Determine the role of government in preventing private monopolies and regulating public monopolies.
1435.7.3 Research U.S. laws and government regulations that are designed to maintain competition.
1435.7.4 Compare and contrast price and non-price competition.

Standard 8: Personal Financial Resources and Consumer Decisions (1435.S.8)
Manage limited personal financial resources and recognize that more of the wants and needs of members of a society can be satisfied if wise consumer decisions are made.

Personal Financial Resources and Consumer Decisions Objectives
Students will:
1435.8.1 Analyze the consumer decision making process for products and explain why there is variance in price for a given item bought from different suppliers.
1435.8.2 Use published consumer resources to collect information for making buying decisions.
1435.8.3 Identify sources and types of credit.
1435.8.4 Calculate the cost of credit.
1435.8.5 Develop a plan to allocate financial resources to meet an individual's financial goals.
1435.8.6 Describe the advantages and disadvantages of different saving and investing plans.
1435.8.7 Identify services that financial institutions provide to customers.
1435.8.8 Perform the steps involved in opening and using a checking account.
1435.8.9 Reconcile a bank statement.

Standard 9: U.S. Economy Functions and Measures (1435.S.9)
Explain how the U.S. economy functions as a whole and describe economic measures of economic activity such as gross domestic product, unemployment and inflation.

U.S. Economy Functions and Measures of Activities Objectives
Students will:
1435.9.1 Explain the Consumer Price Index.
1435.9.2 Analyze the factors that affect Gross Domestic Product.

Standard 10: Role of Government in an Economic System (1435.S.10)
Discuss the role of government in an economic system, especially the necessary and desirable role of government in the U.S. economy.

Role of Government in an Economic System Objectives
Students will:
1435.10.1 Explain how government taxation affects consumers and producers.
1435.10.2 Define and give examples of progressive, regressive, and proportional taxes.
1435.10.3 Analyze the effect of national debt on the level of economic activity.

Standard 11: U.S. Economy Citizens Rights and Responsibilities (1435.S.11)
Describe rights and responsibilities of citizens in the U.S. economy.

U.S. Economy Citizens Rights and Responsibilities Objectives
Students will:
1435.11.1 Identify consumer rights.
1435.11.2 Describe how legislation defines and protects consumer rights.
1435.11.3 Examine how society's needs are balanced against the individual's rights and responsibilities.
1435.11.4 Explain how consumer legislation affects product.
1435.11.5 Distinguish between fraudulent, misleading, and legitimate product claims.

Standard 12: Economic Relationships Among Nations (1435.S.12)
Examine the importance of economic relationships among nations and discuss the role of international trade and investment and international monetary relations in the global economy.

Economic Relationships Among Nations Objectives
Students will:
1435.12.1 Explain the importance of imports and exports in a global economy.
1435.12.2 Identify examples of goods and services that imported and exported.
1435.12.3 Explain foreign exchange rates and why the value of currency changes.
1435.12.4 Explain the advantages and disadvantages of free trade agreements between and among nations.

International Business and Marketing

This course is for students with a career interest in the field of international trade or for students who intend to pursue a business/marketing degree. This course provides students with an understanding of the various careers in international trade, finance and marketing. Fundamental concepts, principles, and theories of marketing in an international setting are considered.

Standard 1: Role of International Business (1437.S.1)
Explain the Role of International Business.

Role of International Business Objectives
Students will:

1437.1.1 Identify examples of international trade in the local and state community.
1437.1.2 Describe the impact of international business activities on the local, regional and national levels.
1437.1.3 Analyze the impact of a domestic company involving itself in international trade opportunities.
1437.1.4 Describe the resources (e.g., ports, trade routes, transportation centers, foreign trade zones and natural, financial, and human resources) of major cities around the world.
1437.1.5 Identify business opportunities in countries in various levels of economic development.

Standard 2: Communication Strategies (1437.S.2)
Apply Communication Strategies in International Business Relations.

Communication Strategies Objectives
Students will:

1437.2.1 Compose effective business communications.
1437.2.2 Analyze international business blunders resulting from ineffective or incorrect communication patterns.
1437.2.3 Identify international cultural differences in food, dress, social behaviors and language.
1437.2.4 Compare business protocol of various countries.
1437.2.5 State examples of non-verbal communication affecting international businesses.

Standard 3: Social, Cultural, Political, Legal, and Economic Factors (1437.S.3)
Describe Factors That Shape and Impact the International Business Environment.

Social, Cultural, Political, Legal and Economic Factors that Impact the International Business Environment Objectives
Students will:

1437.3.1 Identify distinctive social and cultural factors affecting business activities (e.g. time, workday, workweek, schedules, holidays).
1437.3.2 Describe how trade barriers, tariffs, quotas and taxation policies affect choice of location for companies operating internationally.
1437.3.3 Recognize legal differences that exist between and among countries in areas such as consumer protection, product guidelines, labor laws, contract formulation, liability and taxation.
1437.3.4 Define terms such as GDP (GNP), balance of trade, foreign debt and cost of living.
1437.3.5 Analyze the availability of resources and economic potential in various countries.
1437.3.6 Identify the economic systems used to decide what to produce, how it is produced, and for whom it is produced in a country.
1437.3.7 Evaluate the competitive strengths and weaknesses faced by a company involved in international business.

Standard 4: International Finance and Risk Management (1437.S.4)
Explain the Role, Importance, and Concepts of International Finance and Risk Management.

International Finance and Risk Management Objectives
Students will:
1437.4.1 Explain how currency exchange rates affect companies.
1437.4.2 Identify risks associated with international trade.

Standard 5: Operations and Management of Human Resources (1437.S.5)
Address the Operations and Management of Human Resources.

Operations and Management of Human Resources Objectives
Students will:
1437.5.1 Describe the production processes used to create goods and services in different countries.
1437.5.2 Discuss factors that influence the type of merchandise/inventory control systems used by companies operating internationally.
1437.5.3 Identify the factors that influence the application of managerial styles in different countries.
1437.5.4 Describe how compensation and employee benefits differ in various cultures.
1437.5.5 Identify how differences in occupational health and safety standards impact the conduct of business internationally.

Standard 6: Marketing Concepts (1437.S.6)
Apply Marketing Concepts to International Business.

Marketing Concepts Objectives
Students will:
1437.6.1 Describe how a company markets a product/service in other countries.
1437.6.2 Illustrate how social, cultural, technological and geographic factors influence consumer buying behavior in different countries.
1437.6.3 Evaluate market potential for a good or service in a foreign market.
1437.6.4 Describe how the marketing mix elements need to be adapted for international marketing efforts.
1437.6.5 Analyze buying patterns of consumers in a foreign market.
1437.6.6 Explain how the marketing research process, including data collection, differs in an international application.
1437.6.7 Give examples of countries that have absolute and comparative advantage.
1437.6.8 Explain how brands and packages are affected by culture.
1437.6.9 Explain how the business environment affects prices charged in foreign markets.
1437.6.10 Select distribution channels for a company involved in international business.
1437.6.11 Discuss media used in different foreign markets.
1437.6.12 Analyze the influence of social and cultural factors affecting promotions used in foreign markets.

Standard 7: Trade Concepts in the Import/Export Process (1437.S.7)
Relate Balance of Trade Concepts to the Import/Export Process.

Trade Concepts Objectives
Students will:
1437.7.1 Identify goods and services imported to or exported from a country.
1437.7.2 Analyze the import or export potential for a good or service.
1437.7.3 Describe the role that U.S. Customs and the customs agencies of other countries play in international trade activities.
1437.7.4 Define why trade barriers are imposed by governments (such as quotas, tariffs, licensing

requirements, exchange rate controls).

1437.7.5 Describe international trade agreements (e.g., GATT, NAFTA).

Standard 8: Business Ownership and Entrepreneurial Opportunities (1437.S.8)

Identify Forms of Business Ownership and Entrepreneurial Opportunities.

Forms of Business Ownership and Entrepreneurial Opportunities Objectives

Students will:

1437.8.1 Analyze various forms of business ownership (e.g., sole proprietorship, corporation, partnership) for different international business situations.

1437.8.2 Determine social and cultural influences on the form of business ownership used or required in different countries.

1437.8.3 Identify potential new international business ventures for locally based companies.

1437.8.4 Distinguish between licensing and franchising for international business activities.

Standard 9: Technology in International Business. (1437.S.9)

Identify Technology Utilized in International Business.

Technology in International Business Objectives

Students will:

1437.9.1 Describe how the use of technology impacts the global market.

1437.9.2 Identify global e-commerce legal issues.

Introduction to Business and Marketing

This course is an introduction course that explores careers in business and marketing, the role of marketing in today's business world and a broad overview of economics.

Standard 1: Careers in Business and Marketing (1439.S.1)
Explore Careers in Business and Marketing.

Careers Objectives
Students will:
1439.1.1 Research and present information regarding careers in business and marketing.
1439.1.2 Explain how economic trends affect employment in business and marketing careers.
1439.1.3 Complete an interest survey to determine potential career options.

Standard 2: Private Enterprise System (1439.S.2)
Define and Explain How the Market Works in a Private Enterprise System.

Private Enterprise Objectives
Students will:
1439.2.1 Explore the benefits businesses provide to the economy.
1439.2.2 Compare and contrast the private enterprise system with other economic systems.
1439.2.3 Distinguish between consumer needs and wants and how they are satisfied.
1439.2.4 Explain how consumers affect the supply and demand for goods and services.
1439.2.5 Explain how prices affect consumers and producers.
1439.2.6 Describe the economic resources used in the production of goods and services.
1439.2.7 Identify and discuss economic measurements.
1439.2.8 Describe the four phases of the business cycle.

Standard 3: Social and Ethical Environment of Business (1439.S.3)
Explore Polices of a Diverse Workforce in Business and Marketing.

Social and Ethical Environment Objectives
Students will:
1439.3.1 Describe reasons for layoffs and downsizing.
1439.3.2 Write a job description.
1439.3.3 Discuss on-the-job policies dealing with diversity, drug use on the job, theft in the workplace and sexual harassment.
1439.3.4 Identify the functions, levels and responsibilities of managers.
1439.3.5 Discuss the pros, cons and implications of unionization.
1439.3.6 Explain what is meant by the social responsibilities of business.

Standard 4: Financial Management (1439.S.4)
Demonstrate the Handling of Business Finances.

Financial Management Objectives
Students will:
1439.4.1 Explain the types and purposes of financial statements.
1439.4.2 Describe the responsibilities of the Federal Reserve System.
1439.4.3 Calculate interest and finance charges.
1439.4.4 Identify the purpose, process and implications of obtaining credit.
1439.4.5 Identify laws that protect the consumer when applying for credit.
1439.4.6 Prepare a personal budget.

1439.4.7 Reconcile a bank statement.
1439.4.8 Obtain information regarding services provided by a financial institution.
1439.4.9 Identify the purpose and types of insurance.

Standard 5: Role of Marketing (1439.S.5)
Define the Role of Marketing in Today's World.

Role of Marketing Objectives
Students will:
1439.5.1 Apply the four elements of the marketing mix to products and services.
1439.5.2 Identify the stages of the product life cycle.
1439.5.3 Determine the appropriate channel of distribution for products.
1439.5.4 Identify the steps of pricing.
1439.5.5 Identify the functions of marketing.

Standard 6: Business Structure
Explore Development and Maintenance of a Business.

Business Structure Objectives
Students will:
1439.6.1 Identify unique characteristics of an entrepreneur.
1439.6.2 Compare and contrast the advantages and disadvantages of the types of business ownerships.
1439.6.3 Discuss the opportunities available to an entrepreneur.
1439.6.4 Identify the parts of a business plan and the components.

Standard 7: Government and Business Relationships (1439.S.7)
Explore the Relationship Between Government and Business.

Relationship Between Government and Business Objectives
Students will:
1439.7.1 Examine regulations that are encountered when starting a small business.
1439.7.2 Distinguish between progressive, proportional and regressive taxes.

Standard 8: International Business (1439.S.8)
Define the Importance of International Business in the Market Place.

International Business Objectives
Students will:
1439.8.1 Discuss the pros and cons of free trade.
1439.8.2 List examples of United States imports and exports.
1439.8.3 Identify specific products that currently are subject to government trade policies.
1439.8.4 Compare and contrast the economic systems.
1439.8.5 Identify benefits and challenges to competition in the international marketplace.

Standard 9: Role of a Consumer (1439.S.9)
Identify the Role of a Consumer in Business and Marketing.

Role of a Consumer Objectives
Students will:
1439.9.1 Describe choices consumers make when buying goods and services.
1439.9.2 Discuss the basic rights and responsibilities of a consumer.
1439.9.3 Research why regulations are implemented and the effects the regulations have on consumer safety.

Keyboarding and Information Processing

A one-year course designed to provide learners with keyboarding skills required for success in academic and occupational areas. Concepts in this area include keyboard operation, formatting skills, computer skills, appropriate work habits, and career awareness.

Standard 1: Exhibit Good Work Habits. (1441.S.1)
Exhibit good work habits.

Work Habits Objectives
Students will:

1441.1.1 Follow oral and written instructions in the completion of assigned tasks and plan work efficiently to meet deadlines.
1441.1.2 Exhibit the attitudes and work habits necessary for good interpersonal and employee/employer relations in the workforce.
1441.1.3 Keep the area in and around the workstation organized by properly assembling supplies and information necessary to complete assigned tasks.
1441.1.4 Illustrate desirable work ethics.

Standard 2: Proper Keyboard Operations (1441.S.2)
Demonstrate proper keyboard operation skills.

Keyboard Operations Objectives
Students will:

1441.2.1 Master operation of the alphabet, punctuation, number, and symbol keys by touch.
1441.2.2 Exhibit proofreading skills by visually checking for errors utilizing computer proofreading tools.
1441.2.3 Increase keyboarding speed and accuracy.

Standard 3: Basic Production Skills (1441.S.3)
Apply basic production skills.

Basic Production Skill Objectives
Students will:

1441.3.1 Apply information processing concepts.
1441.3.2 Correctly manipulate document formatting tools.
1441.3.3 Develop language arts skills through composition at the keyboard utilizing capitalization, punctuation, number expression and word usage.
1441.3.4 Using correct grammar, key simple business/personal communications in mailable form.
1441.3.5 Demonstrate basic production and editing skills in keyboarding and formatting copy for short reports, memorandums, personal/business communications from arranged, rough-draft, handwritten, incomplete or unedited copy.
1441.3.6 Illustrate basic formatting skills on enumeration and outlines.
1441.3.7 Identify and correctly use proofreaders' marks.
1441.3.8 Apply horizontal and vertical centering to text.
1441.3.9 Maintain a minimum speed of 40 words per minute with five or fewer errors on a five-minute timed writing.
1441.3.10 Prepare envelopes using USPS style and insert correctly folded letters.
1441.3.11 Key bound and unbound reports with and without special features i.e., endnotes, internal citations, title page, table of contents, and reference page.
1441.3.12 Key various office documents such as minutes of meetings, agendas, cards, labels, forms,

form letters, speeches, tables, and statistical material.
1441.3.13 Practice problem solving and decision-making skills.

Standard 4: Basic Computer Skills (1441.S.4)
Demonstrate basic computer skills.

Basic Computer Skill Objectives
Students will:
1441.4.1 Identify hardware components.
1441.4.2 Demonstrate the proper care and use of hardware and software.
1441.4.3 Be proficient in using operating system commands.
1441.4.4 Demonstrate the functions and common features of word processing software.
1441.4.5 Exhibit an understanding and proper use of document processing terminology.

Standard 5: Careers (1441.S.5)
Investigate careers.

Career Objectives
Students will:
1441.5.1 Integrate the relevance of keyboarding skills to all occupational areas.
1441.5.2 Identify documents relative to an employment portfolio.

Legal Office Management

This course of study is designed to provide the learner with skills to work in a legal office. Major instructional areas include: legal terminology, personal development and employability skills, managing legal records, processing mail, communication duties, applying computing, accounting, and data skills, processing legal correspondence, operating office equipment, using management skills, and completing office support activities.

Standard 1: Client Service Activities (1443.S.1)
Conduct client service activities.

Client Service Activities Objectives
Students will:

1443.1.1 Gather client information and determine referrals based on legal specialty and urgency of request.
1443.1.2 Communicate with officers of the court, administrative agencies, and resource persons.
1443.1.3 Identify procedures for handling client complaints.
1443.1.4 Prepare and manage client records.
1443.1.5 Establish and maintain a forms and template file.
1443.1.6 Initiate a reference manual.
1443.1.7 Add supplements to law library and access Internet resources.
1443.1.8 Maintain a database of officers of the court, administrative agencies, and resource persons.
1443.1.9 Identify procedures for maintaining confidentiality of client information.
1443.1.10 Identify the attitudes and work habits necessary for professional relations with clients and staff in a legal office.
1443.1.11 Identify issues related to electronic transfer of legal documents.

Standard 2: Financial Management (1443.S.2)
Develop financial management skills.

Financial Management Objectives
Students will:

1443.2.1 Collect fees for reporting depositions and court records.
1443.2.2 Maintain firm and client checkbook accounts.
1443.2.3 Key attorney's time sheet.
1443.2.4 Initiate and maintain client account records (including time spent in meetings and phone calls with clients).
1443.2.5 Prepare billing statements.

Standard 3: Legal Correspondence (1443.S.3)
Prepare legal correspondence.

Legal Correspondence Objectives
Students will:

1443.3.1 Use correct legal terms in correspondence.
1443.3.2 Prepare letters in legal format from handwritten copy, from rough-draft copy, and from dictation.
1443.3.4 Edit and revise legal correspondence.

Standard 4: Document Production (1443.S.4)
Display document production techniques.

Document Production Objectives
Students will:

1443.4.1 Transcribe dictated material to prepare legal documents and correspondence.
1443.4.2 Compose correspondence and appropriate forms to request or communicate information.
1443.4.3 Keyboard information using appropriate forms and equipment to format and prepare letters, labels, documents, forms, and statistical reports.
1443.4.4 Proofread documents using visual and written communication skills to verify accuracy and completeness and make any necessary corrections.
1443.4.5 Prepare litigation documents and forms to communicate information.
1443.4.6 Prepare non-litigation documents and forms to communicate information.

Standard 5: Employability Skills (1443.S.5)
Enhance employability skills.

Employability Skill Objectives
Students will:

1443.5.1 Discuss and identify the advantages of a professional affiliation and investigate certification options for legal office personnel.
1443.5.2 Identify personal interests, aptitudes, and attitudes related to the qualities found in successful legal office personal.
1443.5.3 Apply the principles of ergonomics to the legal office work area.
1443.5.4 Develop human relations skills appropriate to dealing with people under stress.
1443.5.5 Promote and exemplify high standards of loyalty, cooperation, and courtesy.
1443.5.6 Develop a career ladder of occupational opportunities in the legal office and related fields.
1443.5.7 Participate in a mock interview for a legal office position.
1443.5.8 Compose a letter of application and an interview follow-up letter.
1443.5.9 Identify the steps to follow in resigning from a position.
1443.5.10 Identify the purpose and types of continuing education.
1443.5.11 Update portfolio.

Medical Office Management

This course of study is designed to provide the (student) learner with skills to work as a medical office assistant. Major instructional objectives include: handling telephone calls, scheduling appointments, greeting patients, and preparing effective communications. Students will: also become proficient with medical records, patient billing, health insurance, financial records, travel arrangements, meeting preparations, and medical terminology. This course is strongly recommended for *Grade 12-Adult.*

Standard 1: Medical Business Legal and Ethical Procedures (1443.S.1)
Analyze medical business ethics and legal responsibilities.

Medical Business Legal and Ethical Procedural Objectives
Students will:
1443.1.1 Identify proper procedures for selecting, preparing, and releasing patient information.
1443.1.2 Summarize safeguards for preventing malpractice litigation as they apply to employees.

Standard 2: Administrative Tasks (1443.S.2)
Conduct and manage administrative responsibilities.

Administrative Responsibilities Objectives
Students will:
1443.2.1 Demonstrate telephone etiquette when screening incoming calls and placing outgoing calls.
1443.2.2 Apply guidelines of scheduling appointments and proper recording of cancellations and no-shows.
1443.2.3 Demonstrate the correct use of alphabetic, geographic, subject, and numeric filing.
1443.2.4 Demonstrate the correct use of alphabetic and numeric color coding for medical records filing.
1443.2.5 Process incoming and outgoing mail via postal service, facsimile, and e-mail.
1443.2.6 Prepare documents from rough-draft copy and from dictation using proper formatting and editing procedures and correct medical terminology.
1443.2.7 Compose written communications for a variety of situations.
1443.2.8 Transcribe dictation and enter reports into a patient's chart using proper medical terminology and abbreviations.
1443.2.9 Analyze coding as related to procedures and diseases.

Standard 3: Insurance Claims (1443.S.3)
Process health insurance claims.

Processing Health Insurance Claim Objectives
Students will:
1443.3.1 Describe and differentiate various types of insurance coverage and insurance plans.
1443.3.2 Prepare (HCFA) Health Care Financing Administration insurance claim forms for various insurance carriers.
1443.3.3 Explain the follow-up process for insurance claims after receiving the EOB (Explanation of Benefits) from the insurance carrier.

Standard 4: Meeting and Travel Preparation (1443.S.4)
Plan medical meetings and arrange travel.

Meeting and Travel Preparation Objectives
Students will:
1443.4.1 Determine guidelines for arranging meetings.

1443.4.2 Key an agenda.
1443.4.3 Key minutes of a meeting.
1443.4.4 Determine guidelines for making travel arrangements.
1443.4.5 Key an itinerary.

Standard 5: Office Management (1443.S.5)
Perform office management skills.

Office Management Objectives
Students will:
1443.5.1 Initiate the development of an office procedures manual.
1443.5.2 Apply the principles of ergonomics to the medical assistant's work area.
1443.5.3 Maintain an inventory of office forms, supplies, and equipment.

Standard 6: Financial Management (1443.S.6)
Develop financial management skills.

Financial Management Objectives
Students will:
1443.6.1 Obtain necessary information from the patient for billing and insurance purposes.
1443.6.2 Compute charges and record appropriate entries for services rendered and charges from the superbill.
1443.6.3 Prepare daily journals.
1443.6.4 Maintain monthly summary records.
1443.6.5 Receive payment for services rendered and issue receipts.
1443.6.6 Reconcile a bank statement.
1443.6.7 Prepare statements/bills on appropriate forms.
1443.6.8 Prepare payroll records.

Standard 7: Employability Skills (1443.S.7)
Enhance employability skills.

Employability Objectives
Students will:
1443.7.1 Discuss and identify advantages of a professional affiliation and investigate certification options for medical office personnel.
1443.7.2 Identify personal interests, aptitudes, and attitudes related to the qualities found in successful medical office personnel.
1443.7.3 Develop human relations skills appropriate to dealing with people under stress.
1443.7.4 Promote and exemplify high standards of loyalty, cooperation and courtesy.
1443.7.5 Develop a career ladder of occupational opportunities in the medical office and related fields.
1443.7.6 Participate in a mock interview for a medical office position.
1443.7.8 Compose a letter of application and an interview follow-up letter.
1443.7.9 Identify the steps to follow in resigning from a position.
1443.7.10 Identify the purpose and types of continuing education.
1443.7.11 Update portfolio.

Management and Entrepreneurship

This course provides a background for the development and operation of a business starting with the role of the entrepreneur in our economy to the development of a business plan and the application of specific marketing skills and concepts within the business environment. This course also explores the planning, organizing and controlling of a business, including organizational and human aspects, with emphasis on various theories of management, the knowledge and understanding necessary for managing people and functions, and decision making.

Standard 1: Careers in Supervision and Management (1445.S.1)
Explore the career of a supervisor/manager.

Supervision and Management Career Objectives
Students will:

1445.1.1 Identify unique characteristics of an entrepreneur.
1445.1.2 Compare and contrast the scientific management, functional, human relations/behavioral school and quantitative approaches of management.
1445.1.3 Identify the characteristics of a successful supervisor/manager.
1445.1.4 Identify and discuss the major demographic and societal trends that will affect supervisors/managers in the future.
1445.1.5 Summarize the difficulties supervisors/managers face in fulfilling managerial roles.

Standard 2: Managerial Functions of Supervision (1445.S.2)
Apply the managerial functions to a supervisor or manager's role.

Managerial Function Objectives
Students will:

1445.2.1 Describe and apply the basic steps of the decision-making process.
1445.2.2 Discuss the functions utilized in management.
1445.2.3 Write a mission statement for a business or department.
1445.2.4 Identify examples of strategic plans, tactical plans and operational plans.
1445.2.5 Explain the concept of a chain of command.

Standard 3: Management Communication Skills (1445.S.3)
Explain the importance of effective communication in the manager's role.

Effective Communication Objectives
Students will:

1445.3.1 Define communication and discuss its implication for effective management in the manager's role.
1445.3.2 Diagram the communication process and explain the importance of each component to the process.
1445.3.3 Identify barriers to communication and suggest methods to overcome those barriers.
1445.3.4 Compare and contrast the formal, informal, horizontal and vertical channels of communication.
1445.3.5 Demonstrate effective communication skills.

Standard 4: Employee Motivation (1445.S.4)
Apply employee motivational factors to the manager's role.

Employee Motivation Objectives

Students will:

1445.4.1 Compare various motivation theories and explain their importance for understanding employee behavior.
1445.4.2 Analyze the application of Theory X and Theory Y in motivating employees.
1445.4.3 Classify motivational factors according to Maslow's hierarchy of needs.
1445.4.4 Define job rotation, job enlargement, and job enrichment and their implications in motivating employees.
1445.4.5 Investigate the significance of Total Quality Management (TQM).
1445.4.6 Explain the concept of authority, responsibility and power as a requirement of any managerial position.
1445.4.7 Define delegation, responsibility and accountability and describe their relationship with one another.

Standard 5: Entrepreneurship (1445.S.5)
Explore the role of an entrepreneur.

Entrepreneur Objectives
Students will:

1445.5.1 Compare and contrast the advantages and disadvantages of the types of ownership.
1445.5.2 Identify entrepreneurial opportunities.
1445.5.3 Analyze the parts of a business plan and components included in each part.
1445.5.4 Write and present a business plan for a small business.

Standard 6: Marketing Plan (1445.S.6)
Write a marketing plan for a small business.

Marketing Plan Objectives
Students will:

1445.6.1 Complete a demographic study to determine a market.
1445.6.2 Determine market potential.
1445.6.3 Identify direct and indirect competition.
1445.6.4 Evaluate competitive strengths and weaknesses.
1445.6.5 Explain the importance of choosing a proper location for a business.
1445.6.6 Describe the different types of goods and services.
1445.6.7 State the marketing concept.
1445.6.8 Utilize market segmentation and target marketing.
1445.6.9 Identify and apply the components of the marketing mix.
1445.6.10 Evaluate the importance of price.
1445.6.11 Describe different pricing strategies.
1445.6.12 Calculate price.
1445.6.13 Describe the steps in the selling process.

Standard 7: Financial Plan (1445.S.7)
Write a financial plan for a small business.

Financial Plan Objectives
Students will:

1445.7.1 Analyze the components of a financial plan.
1445.7.2 Compute capital needs.
1445.7.3 Prepare financial statements (income statement, balance sheet, statement of cash flow).
1445.7.4 Analyze financial statements to ascertain financial health of a business.

1445.7.5 Identify parts of an accounting system.
1445.7.6 Write a personal resume.
1445.7.7 Calculate personal net worth.
1445.7.8 Identify personal/financial assets available to collateralize.
1445.7.9 List potential sources of funds for a business.

Standard 8: Management Plan (1445.S.8)
Write a management plan for a small business.

Management Plan Objectives
Students will:
1445.8.1 Compare and contrast types of business ownership.
1445.8.2 Develop an organizational chart.
1445.8.3 Explain how small businesses recruit effectively.
1445.8.4 Prioritize staffing needs.
1445.8.5 Identify motivational techniques for employees.
1445.8.6 Explain employment laws.
1445.8.7 Monitor results of revenue and explain its impact on inventory, personnel, insurance and promotion.
1445.8.8 Analyze inventory procedures.
1445.8.9 Identify resources available for small business assistance.
1445.8.10 Identify government regulations.
1445.8.11 Research business risks and prevention control.
1445.8.12 List and explain components of a legally enforceable contract.
1445.8.13 Discuss business ethics and social responsibility.

Notetaking and Study Skills

This course is designed to provide students with basic abbreviated writing skills and enables them to take and transcribe notes at speeds appropriate for educational, business, personal use. Students explore reasons for taking notes, ways to listen effectively, and strategies for improving communication and study skills for academic success.

Standard 1: Reading and Writing Abbreviated Writing (1447.S.1)
Read and write the abbreviated writing system.

Reading and Writing Objectives
Students will:

1447.1.1 Read fluently from textbook plates and homework notes.
1447.1.2 Achieve a minimum reading of 80 words per minute.
1447.1.3 Write the abbreviated language for dictated words, abbreviations, and documents.

Standard 2: Transcription and Dictation (1447.S.2)
Demonstrate dictation and transcription skills.

Transcribing and Dictation Objectives
Students will:

1447.2.1 Transcribe the abbreviated language from the textbook plates and homework into longhand using appropriate format.
1447.2.2 Transcribe a variety of business documents (memos, letters, outlines) using appropriate format.
1447.2.3 Take dictation for two to three minutes at a minimum of 50 words per minute with 90% accuracy.
1447.2.4 Use the abbreviated language to take notes from lectures.
1447.2.5 Proofread documents for spelling, punctuation, capitalization, number usage, accuracy of content, and clarity of expression.

Standard 3: Note Making Skills (1447.S.3)
Develop sound note making skills that can be applied to education, career, and personal use.

Applying Note Making Skills Objectives
Students will:

1447.3.1 Practice notetaking skills to process and organize information using the abbreviated writing system.
1447.3.2 Practice notetaking skills from lectures such as the outline format.

Standard 4: Study Skills (1447.S.4)
Develop study skills for academic success.

Success in Academic Studying Skills Objectives
Students will:

1447.4.1 Refine appropriate listening skills.
1447.4.2 Set goals for learning and review progress in meeting these goals.
1447.4.3 Take notes from reading and study for tests using various methods.
1447.4.4 Review and revise notes.
1447.4.5 Develop skills in organizing and managing work stations, setting priorities for tasks, and making decisions.

1447.4.6 Use notetaking skills to prepare reference cards, note cards, and outlines for research.
1447.4.7 Organize study materials (notes, handouts, tests, etc.).
1447.4.8 Demonstrate skill in test-taking techniques.
1447.4.9 Apply all techniques of effective time management.

Office Management

Prerequisite: Keyboarding Applications
This area of study is designed to aid students in becoming skillful in the operation of an office. Major instructional areas include: personal development and employability skills, managing records, processing mail, communication duties, keeping financial records, applying computing, accounting, and data skills, processing business correspondence, operating office equipment, using management skills, and completing office support activities.

Standard 1: Office Administrative Careers (1449.S.1)
Explore office administrative careers.

Office Administrative Career Objectives
The student will:
1449.1.1 Research office administrative positions and their educational requirements.
1449.1.2 Identify confidentiality concepts and policies in an office.
1449.1.3 Identify characteristics of professional conduct (integrity, loyalty, courtesy, etc).
1449.1.4 Discuss personal and office ethics
1449.1.5 Describe attitudes that contribute to success.

Standard 2: Communication Skills (1449.S.2)
Communicate effectively in a professional and personal manner.

Effective Communications Objectives
The student will:
1449.2.1 Create and maintain effective and productive work relationships.
1449.2.2 Develop efficient office teams.
1449.2.3 Compose business correspondence.
1449.2.4 Reproduce and distribute documents and information.
1449.2.5 Prepare camera ready copy.
1449.2.6 Simulate placing and receiving telephone calls including conference calls.
1449.2.7 Prepare written telephone messages.
1449.2.8 Process incoming and out-going mail, including electronic mail.
1449.2.9 Identify emerging telecommunications.

Standard 3: Office System Maintenance (1449.S.3)
Demonstrate maintaining an office system.

Office System Maintenance Objectives
The student will:
1449.3.1 Conduct a needs assessment.
1449.3.2 Prepare and maintain an inventory record of software, furniture, hardware, equipment and supplies.
1449.3.3 Prepare a cost analysis.
1449.3.4 Maintain personal computer/network and printer.
1449.3.5 Demonstrate maintenance of office equipment such as copiers and fax machines (add toner, load paper, clear paper path, change cartridge).
1449.3.6 Discuss and maintain work station safety.

Standard 4: Financial Functions (1449.S.4)
Prepare and manage financial functions.

Financial Objectives
The student will:
1449.4.1 Prepare banking transactions (deposit slips, reconcile bank statement, etc.).
1449.4.2 Manage petty cash funds and cash advance accounts.
1449.4.3 Prepare payroll records.
1449.4.4 Prepare and post check records.
1449.4.5 Determine budgetary requirements for office supplies and equipment. AM2
1449.4.6 Develop an office budget.
1449.4.7 Complete purchase requisitions and vouchers for payment.
1449.4.8 Identify various collection procedures.

Standard 5: Information Management (1449.S.5)
Prepare and manage information.

Information Management Objectives
The student will:
1449.5.1 Maintain alphabetical filing system and retrieve information from files.
1449.5.2 Maintain subject filing system and retrieve information from files.
1449.5.3 Maintain numerical filing system and retrieve information from files.
1449.5.4 Maintain chronological filing system and retrieve information from files.
1449.5.5 Maintain tickler file system and retrieve information from files.

Standard 6: Information and Data Processing (1449.S.6)
Accurately prepare and process information and data.

Preparing and Processing Information and Data Objectives
The student will:
1449.6.1 Key documents (agendas, statistical documents, correspondance, etc.).
1449.6.2 Use touch system of entry on calculators and 10-key pads.
1449.6.3 Transcribe dictation from recorded media (correspondence, reports, minutes of meetings, etc.).
1449.6.4 Dictate notes and correspondence.
1449.6.5 Enhance formatting of documents.
1449.6.6 Create and format tables and charts.
1449.6.7 Perform a variety of word processing functions (merge text, sort data, search/replace data, create macros, etc.).
1449.6.8 Convert document from one operating system to another.
1449.6.9 Create, edit and enhance spreadsheets.
1449.6.10 Create and edit a database.
1449.6.11 Create queries.
1449.6.12 Generate reports
1449.6.13 Integrate database, spreadsheet, graphic and word processing files.
1449.6.10 Develop text editing and proofreading skills.

Standard 7: Organizing and Planning (1449.S.7)
Demonstrate organizing and planning functions.

Organizing and Planning Objectives
The student will:
1449.7.1 Demonstrate time management skills.
1449.7.2 Coordinate meetings, events and travel arrangements related to the office.
1449.7.3 Recommend improvements in physical layout of the office.
1449.7.4 Follow written and oral directions.
1449.7.5 Give written and oral directions.

1449.7.6 Discuss and maintain office safety

Standard 8: Human Relationship Skills (1449.S.8)
Demonstrate human relations skills.

Human Relation Objectives
The student will:
1449.8.1 Develop work processes and procedures (organizational and prioritizing skills).
1449.8.2 Develop techniques for introducing and implementing changes.
1449.8.3 Coordinate administrative support staff work schedule and workload distribution.
1449.8.4 Provide feedback to teams and individuals.
1449.8.5 Contribute to development of job descriptions for administrative support staff.
1449.8.6 Discuss and analyze an employee performance evaluation

Standard 9: Employability
Develop employability skills. **(1449.S.9)**

Employability Objectives
The student will:
1449.9.1 Develop a career plan and professional growth plan.
1449.9.2 Develop and update a resume.
1449.9.3 Complete a job application form and write a letter of application.
1449.9.4 Demonstrate successful interviewing techniques.
1449.9.5 Develop and maintain a portfolio.
1449.9.6 Apply for a promotion.
1449.9.7 Identify the steps to follow in resigning from a position.
1449.9.8 Discuss soliciting letters of recommendation.

Personal Finance

Personal Finance is a multi-disciplinary approach to personal financial management for high school students.

Standard 1: Interrelated Roles (1451.S.1)
Describe the interrelated roles of job seeker, wage earner and employee.

Interrelated Roles Objectives
The student will:
1451.1.1 Explain job search strategies.
1451.1.2 Describe effective tools for securing employment including resume, application letter, interview, and follow-up.
1451.1.3 List examples of employee and employer responsibilities at the workplace.
1451.1.4 Discuss employee benefits, labor unions and professional organizations.
1451.1.5 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship and justice.

Standard 2: Analyzing and Interpreting (1451.S.2)
Analyze and interpret decisions that contribute to financial stability and personal satisfaction.

Analyzing and Interpreting Objectives
The student will:
1451.2.1 Prepare financial planning documents and describe types of contracts.
1451.2.2 Prepare documents used with checking accounts, and compare consumer banking services.
1451.2.3 Explain purposes, types and history of taxes.
1451.2.4 Prepare a short form tax return.
1451.2.5 Give examples of savings options, discuss the need for and purpose of savings and compute interest on savings.
1451.2.6 Discuss investment options, the need for and purpose of investments and the criteria for choosing investments.
1451.2.7 Identify principles of risk management.
1451.2.8 Describe benefits of major types of insurance.

Standard 3: Credit Planning (1451.S.3)
Describe credit and plans for using credit in terms of present and future needs and income.

Credit Planning Objectives
The student will:
1451.3.1 List advantages and disadvantages of credit, types of credit and sources of credit.
1451.3.2 Discuss the concept of creditworthiness as it relates to credit records, credit ratings, credit reports, and credit laws.
1451.3.3 Compute the costs of credit.
1451.3.4 Discuss methods of reducing credit costs and responsibilities of consumer credit.
1451.3.5 List major causes of bankruptcy.
1451.3.6 Identify the advantages and disadvantages of bankruptcy.
1451.3.7 Discuss bankruptcy laws and their purpose and understand how to solve credit problems.

Standard 4: Economic and Consumer Responsibility (1451.S.1)
Describe common economic problems and consumer responsibility in the marketplace.

Common Economic Problems/Consumer Responsibility Objectives

The student will:

1451.4.1 Discuss characteristics of the marketplace and the free enterprise system.

1451.4.2 Identify fraudulent and deceptive practices, and prescribe wise consumer behavior.

1451.4.3 List consumer Legislation, sources of consumer protection, and describe how to contact public officials to express opinions.

1451.4.4 Describe the court system available for use in consumer redress and list other ways of finding remedies for consumer problems.

Spreadsheet Management

This area of study is designed to develop intermediate/advanced-level skills in spreadsheet application software. Students will achieve proficiency and expert level skills and will have the opportunity to receive specialized certification by examination. (One semester class)

Standard 1: Worksheets (1453.S.1)
Format worksheets.

Worksheet Objectives
The student will:
1453.1.1 Apply formats such as accounting, fraction, scientific, etc.
1453.1.2 Create custom formats.
1453.1.3 Use styles and auto formats.

Standard 2: Lists (1453.S.2)
Use lists.

List Objectives
The student will:
1453.2.1 Sort data.
1453.2.2 Query from a list.

Standard 3: Workbooks (1453.S.3)
Print workbooks.

Workbook Printing Objectives
The student will:
1453.3.1 Preview workbooks.
1453.3.2 Print workbooks.

Standard 4: Auditing Worksheets (1453.S.4)
Audit a worksheet.

Worksheet Auditing Objectives
The student will:
1453.4.1 Check and review data.
1453.4.2 Find cells referred to in a specific formula.
1453.4.2 Find formulas that refer to a specific cell.
1453.4.3 Find errors.

Standard 5: Functionality (1453.S.5)
Use advanced functionality.

Functionality Objectives
The student will:
Query databases.
1453.5.1 Extract data.
1453.5.2 Use filters.
1453.5.3 Use data analysis and pivot tables.
1453.5.4 Use data map.
1453.5.5 Use data validation.
1453.5.6 Use conditional formatting.
1453.5.7 Perform multi-level sorts.

Standard 6: Macros (1453.S.6)

Use macros.

Macros Objectives
The student will:
1453.6.1 Create and record macros.
1453.6.2 Edit macros.
1453.6.3 Run macros.

Standard 7: Import and Export Data (1453.S.7)
Import and export data.

Data Importing and Exporting Objectives
The student will:
1453.7.1 Import from other applications.
1453.7.2 Export to other applications.

Standard 8: Templates (1453.S.8)
Use templates.

Template Objectives
The student will:
1453.8.1 Work with existing templates.
1453.8.2 Create templates.
1453.8.3 Edit templates.

Standard 9: Multiple Workbooks (1453.S.9)
Use multiple workbooks.

Multiple Workbook Objectives
The student will:
1453.9.1 Link workbooks.
1453.9.2 Use multiple workbooks.

Standard 10: Workgroup Functions (1453.S.10)
Use workgroup functions.

Workgroup Objectives
The student will:
1453.10.1 Cell tips.
1453.10.2 Share lists.
1453.10.3 Track changes.
1453.10.4 Resolve conflicts.
1453.10.5 Show history of changes.
1453.10.6 Merge workbooks.

Web Page Publishing

This course will introduce students to the basic Web page design concepts and provide practice in creating Web sites. Students will explore various applications in Web page design through hands-on activities and experiences which may include: using Web page development software, creating page layouts, adding images and frames, creating elements and components, creating tables, managing files, publishing to the Internet, creating hyperlinks, organizing tasks, and using HTML.

Standard 1: Basic Design Concepts (1455.S.1)
Discuss web page design concepts.

Basic Web Design Objectives
The student will:
1455.1.1 Acquire navigational skills for using the World Wide Web effectively.
1455.1.2 Define and use Web page design terminology.
1455.1.3 Identify Web page design concepts: i.e. themes, bullets, importing, hyperlinks, and frames.
1455.1.4 Identify confidentiality concepts and policies.
1455.1.5 Identify characteristics of professional conduct.
1455.1.6 Identify and analyze Web page design career opportunities.

Standard 2: Web Page Design Software (1455.S.2)
Demonstrate skills utilizing Web Page design software.

Web Page Design Software Objectives
The student will:
1455.2.1 Create and edit a Web page using HTML.
1455.2.2 Insert images, change image appearance, create Hotspots, and use frames.
1455.2.3 Plan and design a web page, create a page with a Wizard, add pages to a web, add text and format a page.
1455.2.4 Add multimedia elements and enhancements, i.e. sound and video to a Web page.
1455.2.5 Use a digital camera and a scanner to import visuals in a Web page.
1455.2.6 Create a Web Site using templates, themes, insert bullets, import from different software.
1455.2.7 Create and edit Hyperlinks.
1455.2.8 Create a table, add rows and columns, split and merge cells, and change properties.
1455.2.9 Customize elements and components of a Web page, create a custom theme, create page transitions, add hit counter, and create a search form.
1455.2.10 Practice usability testing for uploading Web pages.
1455.2.11 Publish a Web page.
1455.2.12 Manage a Web site (check spelling and change text, work with files, manage hyperlinks and organize tasks).
1455.2.13 Practice programming using JavaScript.
1455.2.14 Evaluate competing Web sites.

Standard 3: Legal and Ethical (1455.S.3)
Determine legal and ethical aspects of Web page publishing.

Legal and Ethical Objectives
The student will:
1455.3.1 Practice ethical use of World Wide Web
1455.3.2 Identify copyright and patent laws pertaining to Web page publication.
1455.3.3 Identify licensing agreements associated with Web Page Design software.
1455.3.4 Explain the purpose of deductions and withholdings.

Diversified Cooperative Training I (DCT)

This area of study is designed to provide students with a wide range of basic attitudes, knowledge, and skills essential for job success.

Standard 1: Health and Safety Procedures (0511.S.1)
Demonstrate the correct procedures to promote health and safety, personally and professionally.

Health and Safety Procedures Objectives
Students will:
0511.1.1 List the most basic safety rules.
0511.1.2 Identify the main causes of accidents and describe ways to reduce safety hazards.
0511.1.3 List the agencies that work to prevent accidents and explain each agency's purpose.
0511.1.4 Propose and follow a plan for the proper procedure in handling accidents.
0511.1.5 Develop a list of personal safety rules as they apply personally and professionally.
0511.1.6 Read and interpret operating instructions before using any equipment.
0511.1.7 Describe the procedures for safe evacuation of the work site in the event of an emergency.
0511.1.8 Classify A, B, and C fires and describes methods of extinguishing.
0511.1.9 Demonstrate procedures for proper lifting methods.

Standard 2: Communications, Critical Thinking, Computation and Computer Applications (0511.S.2)
Use basic skills as applied to communications, critical thinking, computation, and computer applications.

Communications, Critical Thinking, Computation and Computer Applications Objectives
Students will:
0511.2.1 Identify ways of giving orders, directions, and instructions in non-stereotypical language.
0511.2.2 Demonstrate the proper way to introduce yourself and others.
0511.2.3 Use proper telephone protocol and correctly handle messages.
0511.2.4 Develop and practice skills of organizing and delivering oral communications.
0511.2.5 Identify barriers to listening and analyze methods for improving listening.
0511.2.6 Take meaningful notes to recall and accurately report information from an oral presentation.
0511.2.7 Solve problems involving addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions.
0511.2.8 Solve problems using different wage plans.
0511.2.9 Compute trade or cash discounts to arrive at net price.

Standard 3: Professionalism (0511.S.3)
Exhibit responsibility, self-esteem, sociability, self-management, integrity and honesty.

Professionalism Objectives
Students will:
0511.3.1 State the values of having self-respect and a good self-concept.
0511.3.2 Develop a plan for self-improvement through evaluation and constructive criticism by varied levels of authority.
0511.3.3 Identify the steps for creating and maintaining a positive attitude.
0511.3.4 Describe and demonstrate the characteristics of professional conduct.
0511.3.5 Explain ways to participate with others as part of a team.
0511.3.6 List the steps to problem solving.
0511.3.7 Expose students to the opportunities of participating and contributing to professional organizations.

Standard 4: Personal and Financial Resources (0511.S.4)
Identify, organize, plan and allocate resources.

Resource Objectives
Students will:
0511.4.1 Prepare a list of short-term and long-term goals.
0511.4.2 Utilize time management techniques.
0511.4.3 Prepare a budget.
0511.4.4 List and explain the range of services offered customers by banks and credit unions.
0511.4.5 List the steps involved in opening and maintaining different financial accounts.
0511.4.6 Identify the different types of credit and loans and the guidelines for obtaining each.
0511.4.7 State the purpose of insurance.
0511.4.8 Describe workers compensation and employment security programs.

Standard 5: Legal Rights and Obligations (0511.S.5)
Identify necessary legal rights and obligations as related to the workplace.

Legal Rights and Obligations Objectives
Students will:
0511.5.1 List the components necessary in obtaining a legal contract.
0511.5.2 Develop an awareness of one's legal rights and obligations as a productive member of society.
0511.5.3 Classify laws relating to working conditions, wages, hours, social security, and taxes.
0511.5.4 Define sexual harassment and its consequences to all parties involved.
0511.5.5 Choose ethical courses of action and exhibit honesty and reliability in words and actions.

Standard 6: Inter-Relationships (0511.S.6)
Describe the inter-relationships of various social, organizational, and technological systems.

Inter-Relationships Objectives
Students will:
0511.6.1 Identify the types of business ownership.
0511.6.2 Identify the characteristics of global economic systems.
0511.6.3 List the role of government in the U.S. economy.
0511.6.4 Discuss the functions of supply and demand and its influence on the economy.
0511.6.5 Identify the benefits of competition and profit.
0511.6.6 Discuss advantages and disadvantages of self-employment.
0511.6.7 Identify common characteristics of labor unions.
0511.6.8 List reasons labor unions began.
0511.6.9 Explain and demonstrate the concept of collective bargaining.
0511.6.10 Use parliamentary procedure to conduct a meeting.
0511.6.11 Define leadership and develop leadership skills.
0511.6.12 Compare the purposes of school and community organizations.
0511.6.13 Develop socialization and team skills through group activities.
0511.6.14 Exhibit mastery of leadership and technical skills through competitive events.

Standard 7: Job-Seeking, Job-Keeping, and Job-Leaving Skills (0511.S.7)
Develop job-seeking, job-keeping, and job-leaving skills.

Job-Seeking, Job-Keeping, and Job-Leaving Skills Objectives
Students will:
0511.7.1 Compose an employment portfolio, in basic business format, including a resume, cover letter, follow-up letter, letters of acceptance/rejection, and letter of resignation.
0511.7.2 Complete a job application.

0511.7.3 Identify sources of employment opportunities and the steps to initiate a job search.
0511.7.4 Respond positively in all aspects of an interview situation.
0511.7.5 Identify, select, and use technological equipment relevant to the occupation.
0511.7.6 Describe the importance of following a chain of command on the job.
0511.7.7 Appraise the importance of punctuality and dependability on the job.
0511.7.8 Analyze the necessity of mastering job skills.
0511.7.9 Demonstrate how to ask for a raise.
0511.7.10 Participate in an exit interview.
0511.7.11 Identify ways to handle loss of employment.
0511.7.12 Write a letter of reference which could be signed by an employer.
0511.7.13 Discuss reasons people work.
0511.7.14 Use the *Occupational Outlook Handbook* to prepare an occupational information search.
0511.7.15 Explain how occupations and industries are grouped in career clusters.

DIVERSIFIED COOPERATIVE TRAINING II (DCT)

This area of study is designed to provide students with a wide range of basic attitudes, knowledge, and skills essential for job success.

Standard 1: Health and Safety Procedures (0512.S.1)
Demonstrate the correct procedures to promote health and safety, personally and professionally.

Health and Safety Procedures Objectives
Students will:
0512.1.1 List the most basic safety rules.
0512.1.2 Identify the main causes of accidents and describe ways to reduce safety hazards.
0512.1.3 List the agencies that work to prevent accidents and explain each agency's purpose.
0512.1.4 Propose and follow a plan for the proper procedure in handling accidents.
0512.1.5 Develop a list of personal safety rules as they apply personally and professionally.
0512.1.6 Read and interpret operating instructions before using any equipment.
0512.1.7 Describe the procedures for safe evacuation of the work site in the event of an emergency.
0512.1.8 Classify A, B, and C fires and describes methods of extinguishing.
0512.1.9 Demonstrate procedures for proper lifting methods.

Standard 2: Communications, Critical Thinking, Computation and Computer Applications (0512.S.2)
Use basic skills as applied to communications, critical thinking, computation, and computer applications.

Communications, Critical Thinking, Computation and Computer Applications Objectives
Students will:
0512.2.1 Identify ways of giving orders, directions, and instructions in non-stereotypical language.
0512.2.2 Demonstrate the proper way to introduce yourself and others.
0512.2.3 Use proper telephone protocol and correctly handle messages.
0512.2.4 Develop and practice skills of organizing and delivering oral communications.
0512.2.5 Identify barriers to listening and analyze methods for improving listening.
0512.2.6 Take meaningful notes to recall and accurately report information from an oral presentation.
0512.2.7 Solve problems involving addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions.
0512.2.8 Solve problems using different wage plans.
0512.2.9 Compute trade or cash discounts to arrive at net price.

Standard 3: Professionalism (0512.S.3)
Exhibit responsibility, self-esteem, sociability, self-management, integrity and honesty.

Professionalism Objectives
Students will:
0512.3.1 State the values of having self-respect and a good self-concept.
0512.3.2 Develop a plan for self-improvement through evaluation and constructive criticism by varied levels of authority.
0512.3.3 Identify the steps for creating and maintaining a positive attitude.
0512.3.4 Describe and demonstrate the characteristics of professional conduct.
0512.3.5 Explain ways to participate with others as part of a team.
0512.3.6 List the steps to problem solving.
0512.3.7 Expose students to the opportunities of participating and contributing to professional organizations.

Standard 4: Personal and Financial Resources (0512.S.4)
Identify, organize, plan and allocate resources.

Resource Objectives
Students will:
0512.4.1 Prepare a list of short-term and long-term goals.
0512.4.2 Utilize time management techniques.
0512.4.3 Prepare a budget.
0512.4.4 List and explain the range of services offered customers by banks and credit unions.
0512.4.5 List the steps involved in opening and maintaining different financial accounts.
0512.4.6 Identify the different types of credit and loans and the guidelines for obtaining each.
0512.4.7 State the purpose of insurance.
0512.4.8 Describe workers compensation and employment security programs.

Standard 5: Legal Rights and Obligations (0512.S.5)
Identify necessary legal rights and obligations as related to the workplace.

Legal Rights and Obligations Objectives
Students will:
0512.5.1 List the components necessary in obtaining a legal contract.
0512.5.2 Develop an awareness of one's legal rights and obligations as a productive member of society.
0512.5.3 Classify laws relating to working conditions, wages, hours, social security, and taxes.
0512.5.4 Define sexual harassment and its consequences to all parties involved.
0512.5.5 Choose ethical courses of action and exhibit honesty and reliability in words and actions.

Standard 6: Inter-Relationships (0512.S.6)
Describe the inter-relationships of various social, organizational, and technological systems.

Inter-Relationships Objectives
Students will:
0512.6.1 Identify the types of business ownership.
0512.6.2 Identify the characteristics of global economic systems.
0512.6.3 List the role of government in the U.S. economy.
0512.6.4 Discuss the functions of supply and demand and its influence on the economy.
0512.6.5 Identify the benefits of competition and profit.
0512.6.6 Discuss advantages and disadvantages of self-employment.
0512.6.7 Identify common characteristics of labor unions.
0512.6.8 List reasons labor unions began.
0512.6.9 Explain and demonstrate the concept of collective bargaining.
0512.6.10 Use parliamentary procedure to conduct a meeting.
0512.6.11 Define leadership and develop leadership skills.
0512.6.12 Compare the purposes of school and community organizations.
0512.6.13 Develop socialization and team skills through group activities.
0512.6.14 Exhibit mastery of leadership and technical skills through competitive events.

Standard 7: Job-Seeking, Job-Keeping, and Job-Leaving Skills (0512.S.7)
Develop job-seeking, job-keeping, and job-leaving skills.

Job-Seeking, Job-Keeping, and Job-Leaving Skills Objectives
Students will:
0512.7.1 Compose an employment portfolio, in basic business format, including a resume, cover letter, follow-up letter, letters of acceptance/rejection, and letter of resignation.
0512.7.2 Complete a job application.

0512.7.3 Identify sources of employment opportunities and the steps to initiate a job search.
0512.7.4 Respond positively in all aspects of an interview situation.
0512.7.5 Identify, select, and use technological equipment relevant to the occupation.
0512.7.6 Describe the importance of following a chain of command on the job.
0512.7.7 Appraise the importance of punctuality and dependability on the job.
0512.7.8 Analyze the necessity of mastering job skills.
0512.7.9 Demonstrate how to ask for a raise.
0512.7.10 Participate in an exit interview.
0512.7.11 Identify ways to handle loss of employment.
0512.7.12 Write a letter of reference which could be signed by an employer.
0512.7.13 Discuss reasons people work.
0512.7.14 Use the *Occupational Outlook Handbook* to prepare an occupational information search.
0512.7.15 Explain how occupations and industries are grouped in career clusters.

Life Connections

This course will enable students to develop skills for assuming their role in society as productive, successful individuals. Recommended Grade Level: 11-12.

Standard 1: Management (0901.S.1)
The students will develop criteria for managing different phases of one's life span.

Management Objectives
Students will:
0901.1.1 Use decision-making skills to solve problems.
0901.1.2 Analyze components of the management process.
0901.1.3 Examine management needs at various stages of life.
0901.1.4 Develop strategies for managing financial resources.
0901.1.5 Investigate ways to protect environmental resources.
0901.1.6 Practice consumer decisions that meet basic human needs.

Standard 2: Relationships (0901.S.2)
The students will develop an understanding of the different aspects of a healthy, positive relationship.

Relationships Objectives
Students will:
0901.2.1 Evaluate components of respectful health relationships.
0901.2.2 Demonstrate communication skills that contribute to positive relationships.
0901.2.3 Practice conflict resolution techniques.
0901.2.4 Demonstrate leadership skills and community involvement.

Standard 3: Parenting (0901.S.3)
The students will investigate the different phases of parenting and parenting skills.

Parenting Objectives
Students will:
0901.3.1 Analyze parenting roles and responsibilities.
0901.3.2 Explore the impact of diversity on families and society.
0901.3.3 Examine basic parenting skills.
0901.3.4 Investigate laws and services that impact parenting.

Standard 4: Wellness (0901.S.4)
The students will develop an understanding of how food choices can impact one's health and lifestyle.

Wellness Objectives
Students will:
0901.4.1 Evaluate the impact of food choices on wellness.
0901.4.2 Formulate a plan to achieve a health lifestyle.

Standard 5: Careers and Technology (0901.S.5)
The students will demonstrate an understanding of selecting a career and how electronic technologies are used within these career fields.

Careers and Technology Objectives
Students will:
0901.5.1 Develop criteria for making career choices.
0901.5.2 Evaluate strategies for balancing work and personal life.
0901.5.3 Use electronic technologies to complete a variety of assignments.
0901.5.4 Demonstrate appropriate written and oral communications.

Parenting And Child Development

This course is designed to help students evaluate readiness for parenting while examining appropriate parenting and child development practices. Students will develop an awareness of societal issues affecting families and explore support systems. Other areas of focus will be career management and technology. Recommended Grade Level: 9-12.

Standard 1: Readiness for Parenting (0902.S.1)
The students will demonstrate an understanding of the roles and responsibilities of parenting.

Readiness for Parenting Objectives
Students will:
0902.1.1 Describe roles and responsibilities of parenting.
0902.1.2 Analyze personal readiness for parenting.
0902.1.3 Examine family structures.
0902.1.4 Review biological processes related to conception.
0902.1.5 Evaluate contraceptive methods.

Standard 2: Appropriate Parenting/Child Development Practices (0902.S.2)
The students will demonstrate an understanding of appropriate parenting/child development practices.

Parenting/Child Development Practices Objectives
Students will:
0902.2.1 Analyze factors which contribute to prenatal health.
0902.2.2 Review birth processes.
0902.2.3 Analyze factors which contribute to post-natal health.
0902.2.4 Cite theories related to child development.
0902.2.5 Examine the physical, emotional, social, intellectual and moral development of children.
0902.2.6 Evaluate parenting practices that promote health, safety and wellness.
0902.2.7 Recognize appropriate realistic guidance, discipline, and communication techniques.
0902.2.8 Examine the types, causes and effects of child abuse.
0902.2.9 Analyze parenting practices for children with special needs.

Standard 3: Societal Issues Affecting Families (0902.S.3)
The students will explore and evaluate the societal issues affecting families.

Societal Issues Affecting Families Objectives
Students will:
0902.3.1 Explore the impact of diversity on families and society.
0902.3.2 Formulate a plan to deal with crises in families.
0902.3.3 Investigate the legal and ethical impact of science and technology.

Standard 4: Support Systems For Families (0902.S.4)
The students will explore and develop criteria for a family support system.

Support Systems For Families Objectives
Students will:
0902.4.1 Develop criteria for evaluating child care alternatives.
0902.4.2 Review current laws related to parenting.
0902.4.3 Assess sources of assistance available to families.

Standard 5: Career Management and Technology (0902.S.5)
The students will demonstrate an understanding of careers in the area of parenting/child development and how electronic technologies are used within these career fields.

Career Management and Technology Objectives
Students will:
0902.5.1 Explore career opportunities related to parenting/child development.
0902.5.2 Use electronic technologies to complete a variety of assignments.
0902.5.3 Demonstrate appropriate written and oral communications.

Consumer Economics

This course will enable students to analyze human economics and environmental resources. Grades 9-12.

Standard 1: Human Economic and Environmental Resources (0911.S.1)
The students will analyze individual, family and community needs.

Human Economic and Environmental Resources Objectives
Students will:
0911.1.1 Demonstrate management of individual and family needs, including food, clothing, shelter, health care, recreation, and transportation.
0911.1.2 Apply management and planning skills and processes to organize tasks and responsibilities.
0911.1.3 Examine how individuals and families make choices to satisfy needs and wants.
0911.1.4 Implement decisions about providing safe and nutritious food for individuals and families.
0911.1.5 Implement decisions about purchasing, creating, and maintaining clothing.
0911.1.6 Implement decisions about housing and furnishings.
0911.1.7 Examine information about procuring and maintaining health care.
0911.1.8 Implement decisions about recreational needs.
0911.1.9 Apply consumer skills to acquire and maintain transportation.

Standard 2: Environment (0911.S.2)
The students will analyze the relationship of the environment to family and consumer resources.

Environment Objectives
Students will:
0911.2.1 Determine individual and family responsibility in relationship to the environmental trends and issues.
0911.2.2 Examine behaviors that conserve, reuse, and recycle resources to maintain the environment.
0911.2.3 Investigate government regulations for conserving natural resources.

Standard 3: Consumer Rights and Responsibilities (0911.S.3)
The students will analyze policies that support consumer rights and responsibilities.

Consumer Rights and Responsibilities Objectives
Students will:
0911.3.1 Examine state and federal policies and laws providing consumer protection.
0911.3.2 Investigate how policies become laws related to consumer rights.
0911.3.3 Examine skills used in seeking information related to the individual consumer.

Standard 4: Technology Impact (0911.S.4)
The students will evaluate the impact of technology on individual and family resources.

Technology Impact Objectives
Students will:
0911.4.1 Review types of technology that impact family and consumer decision-making.
0911.4.2 Examine how media and technological advances impact family and consumers decisions.
0911.4.3 Assess the use of technology and its impact on quality of life.

Standard 5: Economic System vs. Consumer Actions (0911.S.5)
Students will analyze interrelationships between the economic system and consumer actions.

Economic System vs. Consumer Actions Objectives
Students will:
0911.5.1 Examine the use of resources in making choices that satisfy needs and wants of individuals and families.
0911.5.2 Examine individual and family roles in the economic system.
0911.5.3 Examine economic impacts of laws and regulations that pertain to consumers and providers of services.
0911.5.4 Determine practices that allow families to maintain economic self-sufficiency.

Standard 6: Financial Resources Management (0911.S.6)
Students will demonstrate management of financial resources to meet the goals of individuals and families across the life span.

Financial Resources Management Objectives
Students will:
0911.6.1 Examine the need for personal and family financial planning.
0911.6.2 Apply management principles to decisions about individual and family insurance.
0911.6.3 Obtain personal and legal documents related to managing individual and family finances

Standard 7: Consumer Service Industries Career Paths (0911.S.7)
Student will analyze career paths within consumer service industries.

Consumer Service Industries Career Paths Objectives
Students will:
0911.7.1 Determine roles and functions of individuals engaged in consumer service careers.
0911.7.2 Explore opportunities for employment and entrepreneurial endeavors.
0911.7.3 Examine education and training requirements and opportunities for career paths in consumer services.
0911.7.4 Examine the impact of the consumer service industry on local, state, national and global economies.

Standard 8: Consumer Advocacy (0911.S.8)
Students will analyze factors that impact consumer advocacy.

Consumer Advocacy Objectives
Students will:
0911.8.1 Examine the role of advocacy groups at state and national levels.
0911.8.2 Determine the contributions of policy makers to consumer advocacy.
0911.8.3 Explore strategies that enable consumers to become advocates.
0911.8.4 Examine the effects of consumer protection laws on advocacy.
0911.8.5 Determine strategies to reduce the risk of consumer fraud.
0911.8.6 Examine the role of media in consumer advocacy.
0911.8.7 Determine the effects of manufacturers' policies and procedures on advocacy.
0911.8.8 Explore the use of educational and promotional materials in consumer advocacy.

Standard 9: Long-term Financial Management (0911.S.9)
Students will analyze factors in developing a long-term financial management plan.

Long-term Financial Management Objectives
Students will:
0911.9.1 Explain the impact of the economic system on personal income, individual and family security and consumer decisions.

0911.9.2 Examine components of a financial planning process that reflects the distinction between needs and wants, values, goals, and economic resources.
0911.9.3 Determine the impact on consumers' credit in long-term financial planning.
0911.9.4 Examine investment and savings alternatives.
0911.9.5 Determine the effects of risk management strategies on long term financial planning.
0911.9.6 Consider the impact of key life transitions on financial planning.
0911.9.7 Explain the role of estate planning in long-term financial planning.

Standard 10: Conservation and Waste Management (0911.S.10)
Students will analyze resource consumption for conservation and waste management practices.

Conservation and Waste Management Objectives
Students will:
0911.10.1 Investigate sources and types of commercial energy, waste disposal, and pollution issues.
0911.10.2 Investigate consumer programs and services provided by government, public utilities, resource recovery businesses, and environmental organizations.
0911.10.3 Explore strategies and provide practices to conserve energy and distribute or find information.
0911.10.4 Examine waste management issues.
0911.10.5 Examine roles of government and mixed industry in energy consumption.

Standard 11: Product Development, Testing and Presentation (0911.S.11)
Students will demonstrate skills needed for product development, testing, and presentation.

Product Development, Testing and Presentation Objectives
Students will:
0911.11.1 Conduct market research to determine consumer trends and product development needs.
0911.11.2 Design or analyze a consumer product.
0911.11.3 Examine features, prices, product information, styles, and performance of consumer goods for potential trade-offs among the components.
0911.11.4 Perform a test on a product utilizing valid and reliable testing procedures.
0911.11.5 Apply statistical analysis processes to interpret, summarize, and report data from tests.
0911.11.6 Examine the labeling, packaging, and support materials of consumer goods.
0911.11.7 Demonstrate a product or educate an audience.
0911.11.8 Utilize appropriate sales techniques to compare, demonstrate, assist, and advise consumers in the selection of goods and services that meet consumer needs.

Adolescent Parent Program

The focus of this course is to assist the pregnant and parenting teen to complete his/her education by balancing the responsibilities of parenthood and schoolwork.

Standard 1: Adolescent Development (0921.S.1)
The student will analyze present and future life stages.

Adolescent Development Objectives
Students will:

0921.1.1 Describe the steps in the decision-making model and be able to apply them to individual situations.
0921.1.2 Determine life skills necessary to live and prosper in the real world.
0921.1.3 Explain how lifestyle factors influence quality of life.
0921.1.4 Develop verbal and written communication skills.
0921.1.5 Assess self-esteem and its effects upon the self and others.
0921.1.6 Analyze the role of individual responsibility for enhancing health.
0921.1.7 Assess the positive and negative effects of stressors on the body, and develop strategies to cope with stress.

Standard 2: Prenatal Care (0921.S.2)
The student will gain knowledge on how to reduce pregnancy risks.

Prenatal Care Objectives
Students will:

0921.2.1 Describe the male and female reproductive organs and how the process of conception occurs.
0921.2.2 Describe maternal changes during pregnancy.
0921.2.3 Identify ways of meeting the mother's changing physical and emotional needs.
0921.2.4 Evaluate nutritional needs of pregnant and lactating teens.
0921.2.5 Identify nutrients required for fetal development.
0921.2.6 Describe a baby's development from conception to birth.
0921.2.7 Describe the dangers to the baby if the mother smokes, takes drugs or drinks alcohol during her pregnancy.
0921.2.8 Identify environmental influences that cause birth defects or problems for the baby.
0921.2.9 Assess factors related to sexually transmitted diseases and these diseases' effects on the mother and the baby.
0921.2.10 Describe the physical and psychological implications of prenatal exercise and fitness.
0921.2.11 Describe warning signs that may indicate problems for the baby before birth.
0921.2.12 Identify the purpose and procedures of obstetric examinations.
0921.2.13 Explain the labor and delivery process.
0921.2.14 Describe the mother's postpartum care needs.
0921.2.15 Describe characteristics and care of the newborn at the hospital.
0921.2.16 Explain newborn care practices.
0921.2.17 Plan for the prevention of future unwanted pregnancies.

Standard 3: Parenting Roles (0921.S.3)
The student will investigate the role of a responsible parent.

Parenting Roles Objectives
Students will:

0921.3.1 Assess parenting roles and responsibilities in child rearing.
0921.3.2 Discuss reasonable actions to solve common parenting concerns.
0921.3.3 Demonstrate appropriate discipline for children.
0921.3.4 Examine alternative child-care choices.

0921.3.5 Compare the effectiveness of meeting the needs of children.

Standard 4: Child Development (0921.S.4)
The student will access methods to aid in child development.

Child Development Objectives
Students will:
0921.4.1 Describe the realities of caring for a newborn.
0921.4.2 Demonstrate techniques for bathing a baby, preventing and treating diaper rash, caring for a colicky baby, and dealing with a crying baby.
0921.4.3 Demonstrate methods of interacting and playing with children.
0921.4.4 Describe the social, emotional, mental, and physical stages of the developing child, identify factors affecting this development and list the importance of realistic expectations.
0921.4.5 Discuss the factors that influence a child's self-concept.
0921.4.6 Create ways to enhance children's self-worth.
0921.4.7 Demonstrate effective skills for interacting with children, (i.e. touching, massage, talking, role-modeling.)
0921.4.8 Examine children's health and safety issues.
0921.4.9 Research how to childproof a home and eliminate hazards.
0921.4.10 Describe how to select books for young children and techniques for reading to children.
0921.4.11 Describe first-aid skills for common childhood injuries.
0921.4.12 Demonstrate basic cardiopulmonary resuscitation.

Standard 5: Child Nutrition (0921.S.5)
The student will develop an understanding of how food choices will impact a child's health and wellness.

Child Nutrition Objectives
Students will:
0921.5.1 Analyze the nutritional needs of infants.
0921.5.2 Evaluate children's nutritional needs for a healthy lifestyle.
0921.5.3 Create interesting, fun, and nutritional snacks for children.

Standard 6: Financial and Community Resources (0921.S.6)
The student will develop a list of financial and community resources available to pregnant and parenting teens.

Financial and Community Resources Objectives
Students will:
0921.6.1 Identify and assess sources of support for pregnant and parenting teens and their families.
0921.6.2 Identify various parenting resources, and analyze current issues, trends, and research in parenting.
0921.6.3 Demonstrate how to access pregnancy/parenting information through the use of multi-media technology.
0921.6.4 Analyze current national, state and local statistics addressing sexual activity and develop future prevention strategies for the community

Standard 7: Career Development (0921.S.7)
The student will demonstrate the use of electronic technologies for planning and researching career goals.

Career Development Objectives
Students will:
0921.7.1 Set short-term and long-term personal, educational, and career goals.
0921.7.2 Develop a plan to achieve personal, educational, and career goals, and develop a plan to achieve those goals.
0921.7.3 Identify career options based on self-assessment and career assessment data.

0921.7.4 Investigate traditional and non-traditional jobs/careers for women.
0921.7.5 Access gender bias, sex-role stereotyping, and vocational sex equity for men and women.
0921.7.6 Analyze workplace sexual harassment, the laws and incidents of harassment.
0921.7.7 Identify job-seeking and job-keeping skills.

(Base) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0922.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0922.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0922.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0922.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0922.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0922.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0922.2.2 Identify factors affecting both positive and negative self-concept.
0922.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0922.2.4 Investigate, "Who am I."
0922.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0922.2.6 Distinguish good and poor traits of being a good friend.
0922.2.7 Formulate a plan to make yourself a good friend.
0922.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0922.2.10 Identify the relationship between children and parents.
0922.2.11 Define your individual family role.
0922.2.12 Investigate the importance of caring for children in a responsible way.
0922.2.13 Identify relationships between rights and responsibilities of family members.
0922.2.14 Identify family crisis situations and community sources of help.
0922.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0922.S.3)
The student will gain effective management skills.

Management Objectives
Students will:

0922.3.1 Explain the difference between an individual's wants and needs.
0922.3.2 Distinguish between an individual's basic physical and emotional needs.
0922.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0922.3.4 Describe different ways in which resources can be used.
0922.3.5 Describe values, goals and priorities.
0922.3.6 Relate the importance of values in making personal decisions.
0922.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0922.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0922.3.9 Identify the steps in the management process.
0922.3.10 Demonstrate how individuals can manage their time.
0922.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0922.3.12 Demonstrate how to make a budget.
0922.3.13 Research and give examples of how an individual can shop wisely.
0922.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0922.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:

0922.4.1 Give examples of how food is related to family traditions.
0922.4.2 Identify the many roles of food in the body.
0922.4.3 Identify those factors that influence eating habits.
0922.4.4 Differentiate between good and poor food choices.
0922.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0922.4.6 Using the food pyramid, plan daily menus for one week.
0922.4.7 Plan and complete assigned food labs.
0922.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0922.4.9 Identify good vs. bad health habits.
0922.4.10 Demonstrate good posture when standing, walking and sitting.
0922.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0922.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:

0922.5.1 Realize the importance of work in one's daily life.
0922.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0922.5.3 Identify factors which influence needs and wants in consumer choices.
0922.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0922.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0922.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0922.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0922.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0922.6.1 Identify factors affecting a positive personal image.
0922.6.2 Explore good personal grooming habits.
0922.6.3 Inventory personal wardrobe and analyze future clothing needs.
0922.6.4 Explain the difference between fads and fashion.
0922.6.5 Identify different fibers and fabrics.
0922.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0922.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0922.6.8 Identify and practice simple stain removal.
0922.6.9 Review sewing equipment.
0922.6.10 Review and practice minor clothing repairs.
0922.6.11 Complete a simple sewing project.
0922.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0922.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0922.7.1 Explain how housing meets the needs of family members.
0922.7.2 Evaluate types of housing.
0922.7.3 Analyze issues related to housing.
0922.7.4 Identify opportunities for volunteerism with regard to housing.
0922.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0922.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0922.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0922.8.1 Identify current and future work trends.
0922.8.2 Select and investigate one such work trend.
0922.8.3 Inventory future plans and abilities.
0922.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0922.8.5 Research a future career choice and prepare written report.
0922.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0922.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0922.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0922.9.1 Survey needs of local community.
0922.9.2 In conjunction with class members, review surveys and select a community project.

0922.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0922.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0922.10.1 Actively participate in the local FCCLA chapter.
0922.10.2 Investigate and complete a "Step One" project.
0922.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 5) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

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The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0923.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0923.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0923.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0923.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0923.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0923.2.2 Identify factors affecting both positive and negative self-concept.
0923.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0923.2.4 Investigate, "Who am I."
0923.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0923.2.6 Distinguish good and poor traits of being a good friend.
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(Base 6) Basic Attitudes, Skills and Experiences

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0924.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
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0922.2.9 Demonstrate the different family roles individuals play across their life span.
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0924.2.12 Investigate the importance of caring for children in a responsible way.
0924.2.13 Identify relationships between rights and responsibilities of family members.
0924.2.14 Identify family crisis situations and community sources of help.
0924.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0924.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0924.3.1 Explain the difference between an individual's wants and needs.
0924.3.2 Distinguish between an individual's basic physical and emotional needs.
0924.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0924.3.4 Describe different ways in which resources can be used.
0924.3.5 Describe values, goals and priorities.
0924.3.6 Relate the importance of values in making personal decisions.
0924.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0924.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0924.3.9 Identify the steps in the management process.
0924.3.10 Demonstrate how individuals can manage their time.
0924.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0924.3.12 Demonstrate how to make a budget.
0924.3.13 Research and give examples of how an individual can shop wisely.
0924.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0924.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0924.4.1 Give examples of how food is related to family traditions.
0924.4.2 Identify the many roles of food in the body.
0924.4.3 Identify those factors that influence eating habits.
0924.4.4 Differentiate between good and poor food choices.
0924.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0924.4.6 Using the food pyramid, plan daily menus for one week.
0924.4.7 Plan and complete assigned food labs.
0924.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0924.4.9 Identify good vs. bad health habits.
0924.4.10 Demonstrate good posture when standing, walking and sitting.
0924.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0924.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0924.5.1 Realize the importance of work in one's daily life.
0924.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0924.5.3 Identify factors which influence needs and wants in consumer choices.
0924.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0924.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0924.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0924.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0924.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0924.6.1 Identify factors affecting a positive personal image.
0924.6.2 Explore good personal grooming habits.
0924.6.3 Inventory personal wardrobe and analyze future clothing needs.
0924.6.4 Explain the difference between fads and fashion.
0924.6.5 Identify different fibers and fabrics.
0924.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0924.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0924.6.8 Identify and practice simple stain removal.
0924.6.9 Review sewing equipment.
0924.6.10 Review and practice minor clothing repairs.
0924.6.11 Complete a simple sewing project.
0924.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0924.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0924.7.1 Explain how housing meets the needs of family members.
0924.7.2 Evaluate types of housing.
0924.7.3 Analyze issues related to housing.
0924.7.4 Identify opportunities for volunteerism with regard to housing.
0924.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0924.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0924.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0924.8.1 Identify current and future work trends.
0924.8.2 Select and investigate one such work trend.
0924.8.3 Inventory future plans and abilities.
0924.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0924.8.5 Research a future career choice and prepare written report.
0924.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0924.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0924.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0924.9.1 Survey needs of local community.
0924.9.2 In conjunction with class members, review surveys and select a community project.

0924.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0924.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0924.10.1 Actively participate in the local FCCLA chapter.
0924.10.2 Investigate and complete a "Step One" project.
0924.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 7) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0925.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0925.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0925.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0925.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0925.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0925.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0925.2.2 Identify factors affecting both positive and negative self-concept.
0925.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0925.2.4 Investigate, "Who am I."
0925.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0925.2.6 Distinguish good and poor traits of being a good friend.
0925.2.7 Formulate a plan to make yourself a good friend.
0925.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0925.2.10 Identify the relationship between children and parents.
0925.2.11 Define your individual family role.
0925.2.12 Investigate the importance of caring for children in a responsible way.
0925.2.13 Identify relationships between rights and responsibilities of family members.
0925.2.14 Identify family crisis situations and community sources of help.
0925.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0925.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0925.3.1 Explain the difference between an individual's wants and needs.
0925.3.2 Distinguish between an individual's basic physical and emotional needs.
0925.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0925.3.4 Describe different ways in which resources can be used.
0925.3.5 Describe values, goals and priorities.
0925.3.6 Relate the importance of values in making personal decisions.
0925.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0925.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0925.3.9 Identify the steps in the management process.
0925.3.10 Demonstrate how individuals can manage their time.
0925.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0925.3.12 Demonstrate how to make a budget.
0925.3.13 Research and give examples of how an individual can shop wisely.
0925.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0925.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0925.4.1 Give examples of how food is related to family traditions.
0925.4.2 Identify the many roles of food in the body.
0925.4.3 Identify those factors that influence eating habits.
0925.4.4 Differentiate between good and poor food choices.
0925.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0925.4.6 Using the food pyramid, plan daily menus for one week.
0925.4.7 Plan and complete assigned food labs.
0925.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0925.4.9 Identify good vs. bad health habits.
0925.4.10 Demonstrate good posture when standing, walking and sitting.
0925.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0925.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0925.5.1 Realize the importance of work in one's daily life.
0925.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0925.5.3 Identify factors which influence needs and wants in consumer choices.
0925.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0925.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0925.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0925.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0925.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0925.6.1 Identify factors affecting a positive personal image.
0925.6.2 Explore good personal grooming habits.
0925.6.3 Inventory personal wardrobe and analyze future clothing needs.
0925.6.4 Explain the difference between fads and fashion.
0925.6.5 Identify different fibers and fabrics.
0925.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0925.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0925.6.8 Identify and practice simple stain removal.
0925.6.9 Review sewing equipment.
0925.6.10 Review and practice minor clothing repairs.
0925.6.11 Complete a simple sewing project.
0925.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0925.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0925.7.1 Explain how housing meets the needs of family members.
0925.7.2 Evaluate types of housing.
0925.7.3 Analyze issues related to housing.
0925.7.4 Identify opportunities for volunteerism with regard to housing.
0925.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0925.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0925.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0925.8.1 Identify current and future work trends.
0925.8.2 Select and investigate one such work trend.
0925.8.3 Inventory future plans and abilities.
0925.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0925.8.5 Research a future career choice and prepare written report.
0925.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0925.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0925.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0925.9.1 Survey needs of local community.
0925.9.2 In conjunction with class members, review surveys and select a community project.

0925.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0925.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0925.10.1 Actively participate in the local FCCLA chapter.
0925.10.2 Investigate and complete a "Step One" project.
0925.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 8) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0926.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0926.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0926.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0926.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0926.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0926.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0926.2.2 Identify factors affecting both positive and negative self-concept.
0926.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0926.2.4 Investigate, "Who am I."
0926.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0926.2.6 Distinguish good and poor traits of being a good friend.
0926.2.7 Formulate a plan to make yourself a good friend.
0926.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0926.2.10 Identify the relationship between children and parents.
0926.2.11 Define your individual family role.
0926.2.12 Investigate the importance of caring for children in a responsible way.
0926.2.13 Identify relationships between rights and responsibilities of family members.
0926.2.14 Identify family crisis situations and community sources of help.
0926.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0926.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0926.3.1 Explain the difference between an individual's wants and needs.
0926.3.2 Distinguish between an individual's basic physical and emotional needs.
0926.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0926.3.4 Describe different ways in which resources can be used.
0926.3.5 Describe values, goals and priorities.
0926.3.6 Relate the importance of values in making personal decisions.
0926.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0926.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0926.3.9 Identify the steps in the management process.
0926.3.10 Demonstrate how individuals can manage their time.
0926.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0926.3.12 Demonstrate how to make a budget.
0926.3.13 Research and give examples of how an individual can shop wisely.
0926.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0926.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0926.4.1 Give examples of how food is related to family traditions.
0926.4.2 Identify the many roles of food in the body.
0926.4.3 Identify those factors that influence eating habits.
0926.4.4 Differentiate between good and poor food choices.
0926.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0926.4.6 Using the food pyramid, plan daily menus for one week.
0926.4.7 Plan and complete assigned food labs.
0926.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0926.4.9 Identify good vs. bad health habits.
0926.4.10 Demonstrate good posture when standing, walking and sitting.
0926.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0926.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0926.5.1 Realize the importance of work in one's daily life.
0926.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0926.5.3 Identify factors which influence needs and wants in consumer choices.
0926.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0926.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0926.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0926.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0926.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0926.6.1 Identify factors affecting a positive personal image.
0926.6.2 Explore good personal grooming habits.
0926.6.3 Inventory personal wardrobe and analyze future clothing needs.
0926.6.4 Explain the difference between fads and fashion.
0926.6.5 Identify different fibers and fabrics.
0926.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0926.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0926.6.8 Identify and practice simple stain removal.
0926.6.9 Review sewing equipment.
0926.6.10 Review and practice minor clothing repairs.
0926.6.11 Complete a simple sewing project.
0926.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0926.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0926.7.1 Explain how housing meets the needs of family members.
0926.7.2 Evaluate types of housing.
0926.7.3 Analyze issues related to housing.
0926.7.4 Identify opportunities for volunteerism with regard to housing.
0926.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0926.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0926.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0926.8.1 Identify current and future work trends.
0926.8.2 Select and investigate one such work trend.
0926.8.3 Inventory future plans and abilities.
0926.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0926.8.5 Research a future career choice and prepare written report.
0926.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0926.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0926.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0926.9.1 Survey needs of local community.
0926.9.2 In conjunction with class members, review surveys and select a community project.

0926.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0926.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0926.10.1 Actively participate in the local FCCLA chapter.
0926.10.2 Investigate and complete a "Step One" project.
0926.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

Community and Human Services

The student will learn to integrate multiple life roles and responsibilities in family, work and community settings.

Standard 1: Factors Influencing Community Life. (0927.S.1)
The student will examine multiple factors that influence individual, family and community life.

Community Life Objectives
Students will:

0927.1.1 Analyze strategies to manage multiple individual, family, career, and community roles and responsibilities.
0927.1.2 Examine policies, issues, and trends in the workplace and community that impact individuals and families.
0927.1.3 Analyze the impact of social, economic, and technological change on work and family dynamics.
0927.1.4 Analyze ways that individual career goals can enhance the family's capacity to meet goals for all family members.
0927.1.5 Analyze the potential impact of career path decisions on balancing work and family.
0927.1.6 Determine goals for life-long learning and leisure opportunities for all family members.
0927.1.7 Determine skills and knowledge needed to develop a life plan for achieving individual, family and career goals.

Standard 2: Community and Workplace Required Settings. (0927.S.2)
The student will demonstrate skills needed in community and workplace settings.

Required Settings Objectives
Students will:

0927.2.1 Examine potential career choices to determine the knowledge, skills, and attitudes associated with each.
0927.2.2 Demonstrate job seeking and job keeping skills.
0927.2.3 Apply communication skills in community and workplace settings.
0927.2.4 Demonstrate teamwork skills in community and workplace settings.
0927.2.5 Examine strategies to manage the impact of changing technologies in workplace settings.
0927.2.6 Demonstrate leadership skills and abilities in the workplace and community.
0927.2.7 Examine factors that contribute to maintaining safe and healthy work and community environments.
09272.8 Demonstrate work ethics and professionalism.

Standard 3: Community and Civic Responsibilities (0927.S.3)
The student will analyze the reciprocal impact of individual and family participation in community activities.

Community and Civic Responsibilities Objectives
Students will:

0927.3.1 Examine goals that support individuals and family members in carrying out community and civic responsibilities.
0927.3.2 Arrange a plan for individuals and families to select and develop skills in community activities.
0927.3.3 Determine skills that provide beneficial services to the community.
0927.3.4 Examine community resources and systems of formal and informal support available to individuals and families.
09273.5 Examine the impact of public policies, agencies, and institutions on the family.

Human Services, Development and Relationships

This course will promote student growth and development of self and others by providing students with the skills to develop respectful and responsible relationships within their family, career and community.

Standard 1: Growth and Development (0928.S.1)
The student will analyze growth and development of self and others across the life span.

Growth and Development Objectives
Students will:
0928.1.1 Analyze human growth and development across the life span/life cycle.
0928.1.2 Explain principles of human growth and development.
0928.1.3 Examine major historical and current human development theories to interpret human development.
0928.1.4 Examine the basic human needs and patterns that influence individual development.
0928.1.5 Explain factors that shape human development from preconception through aging.
0928.1.6 Determine the impact of social, economic and technological forces.
0928.1.7 Explain the effect of gender, ethnicity, and culture on individual development.

Standard 2: Environment and Personal Forces (0928.S.2)
The student will assess environmental and personal forces that impact growth and development.

Environment and Personal Forces Objectives
The students will:
0928.2.1 Consider the influence of personality, temperament, and experience on learning and development.
0928.2.2 Investigate the interrelationship of physical, emotional, social, and intellectual development across the life span.
0928.2.3 Investigate the impact of heredity and family on human growth and development.
0928.2.4 Assess the effects of environment and community on human growth and development.
0928.2.5 Explain the effect of life events and conditions on individuals' physical and emotional development.
0928.2.6 Analyze family development and change across time and cultures.

Standard 3: Interpersonal Relationships (0928.S.3)
The student will analyze influences that affect interpersonal relationships.

Interpersonal Relationships Objectives
The students will:
0928.3.1 Review functions and expectations of various types of relationships.
0928.3.2 Determine factors contributing to healthy and unhealthy relationships.
0928.3.3 Assess processes for handling unhealthy relationships.
0928.3.4 Appraise the impact of life events and conditions on relationships.
0928.3.5 Assess the effect the various stages of the life span have on relationships.
0928.3.6 Examine the effect of personal needs on relationships.
0928.3.7 Determine the processes for building and maintaining respectful, responsible relationships.
0928.3.8 Explain how self-esteem and self-image affect relationships with others.
0928.3.9 Compare physical, emotional, and intellectual responses to stable versus unstable relationships.
0928.3.10 Demonstrate leadership skills and abilities reflecting the democratic process in the family, workplace, and community.
0928.3.11 Examine the impact of leadership skills, abilities, and styles on collaborative group Actions.

Standard 4: Relationships Skills (0928.S.4)
The student will demonstrate skills for forming respectful and responsible relationships.

Relationships Skills Objectives
Students will:
0928.4.1 Demonstrate leadership skills to support group members and achieve group goals.
0928.4.2 Establish guidelines for leading small groups in the family.
0928.4.3 Examine the strengths and limitations of team members.
0928.4.4 Determine communication principles and patterns that affect human growth and development.
0928.4.5 Examine communication styles and their effects on relationships.
0928.4.6 Examine factors that affect messages communicated to others.
0928.4.7 Examine types of verbal and nonverbal communication.
0928.4.8 Demonstrate active and reflective listening.
0928.4.9 Describe attitudes and behaviors that foster effective communication.
0928.4.10 Examine communication barriers.
0928.4.11 Demonstrate constructive feedback techniques.
0928.4.12 Apply ethical principles in communication.

Standard 5: Healthy Lifestyles Behaviors (0928.S.5)
The student will evaluate behaviors that promote healthy lifestyles.

Healthy Lifestyles Behaviors Objectives
Students will:
0928.5.1 Examine nurturing practices that support development across the life span.
0928.5.2 Assess available support systems that meet human needs.
0928.5.3 Determine the impact of empathy on relationships.
0928.5.4 Demonstrate awareness of diversity and tolerance and their impact on relationships.
0928.5.5 Analyze the consequences of making generalizations about cultural groups.
0928.5.6 Investigate causes of conflict.
0928.5.7 Demonstrate effective conflict prevention and management techniques.
0928.5.8 Determine the role of decision making and problem solving in reducing and managing conflict.
0928.5.9 Demonstrate nonviolent strategies to address conflict.
0928.5.10 Locate community resources that support conflict prevention and management.
0928.5.11 Determine physical, emotional, and intellectual responses to threat.
0928.5.12 Examine types of standards for making judgments related to personal and family relationships.
0928.5.13 Demonstrate ethical behaviors in family, workplace, and community.
0928.5.14 Manage factors contributing to stress.
0928.5.15 Determine symptoms of stress on self, relationships, and work productivity.
0928.5.16 Evaluate strategies for copying with stress.
0928.5.17 Identify situations that require crisis intervention.

Standard 6: Human Services Careers (0928.S.6)
The student will evaluate career options and opportunities in human services.

Human Services Careers Objectives
Students will:
0928.6.1 Examine personal ethical standards.
0928.6.2 Demonstrate transferable employability skills, in relation to individual, family, community, and career roles.
0928.6.3 Analyze technologies and their relationships to managing individual, family, career, and community roles and responsibilities.

0928.6.4 Analyze issues related to the workplace and community, and discuss how these may be addressed by individuals and communities.
0928.6.5 Determine practices that allow families to maintain economic self-sufficiency.
0928.6.6 Research entrepreneurial opportunities related to these careers.

Surviving Today's Experiences and Problems Successfully (STEPS)

Through this year long course the student will develop skills to function successfully within their current family and peer groups. By utilizing basic skills and higher order thinking skill the student will learn management problem techniques, to care for children, nutrition/foods, consumer education, person/family relationships, and clothing and textiles.

Standard 1: Basic Academic Skills (0929.S.1)
The student will reinforce basic academic skills that are integrated throughout the FACS curriculum.

Basic Academic Skills Objectives
Students will:
0929.1.1 Advance reading, writing and math skills through completion of the STEP curriculum assignments.
0929.1.2 Improve communicating skills, both oral and written, through involvement in oral presentations and written reports relating to the STEP curriculum.
0929.1.3 Investigate a variety of Human Services careers.

Standard 2: FCCLA (0929.S.2)
The student will develop a fundamental vision of FCCLA (Family, Career, and Community Leaders of America) at the state and national levels, while participating at the local level.

FCCLA Objectives
Students will:
0929.2.1 Explore FCCLA state and national projects.
0929.2.2 Participate in an FCCLA meetings using basic parliamentary procedure.
0929.2.3 Explain and actively participate in an activity using the steps in the FCCLA planning process to plan local projects.

Standard 3: Careers in Management (0929.S.3)
The student will identify careers in management.

Careers in Management Objectives
Students will:
0929.3.1 Explore opportunities for careers in management.

Standard 4: Personal Resources (0929.S.4)
The student will plan and evaluate use of personal resources.

Personal Resources Objectives
Students will:
0929.4.1 Explore concerns teens have about management.
0929.4.2 Analyze the management process.
0929.4.3 Assess personal values and goals and explain personal responsibilities for setting and reaching goals.
0929.4.4 Determine how resources can be used to reach goals and identify personal resources.
0929.4.5 Review organizational procedures which save time and effort.
0929.4.6 Demonstrate a plan for use of personal time based on personal goals, values and standards.
0929.4.7 Explain reasons management is important in the workplace.

Standard 5: Conservation of Natural Resources (0929.S.5)
The student will identify ways teens can take responsibility for conserving natural resources.

Conservation of Natural Resources Objectives
Students will:
0929.5.1 Identify environmental concerns in the home, the community, the nation and the world.
0929.5.2 Propose a solution to an environmental problem, make a plan and take action.

Standard 6: Child Care and Development Careers (0929.S.6)
The student will identify characteristics of jobs related to childcare and development.

Child Care and Development Careers Objectives
Students will:
0929.6.1 Analyze the role of a babysitter and devise a plan for beginning a babysitting business.
0929.6.2 Describe characteristics of career opportunities related to childcare and development.

Standard 7: Child Care (0929.S.7)
The student will approach problems related to caring for children's play, food, guidance, and safety needs.

Child Care Objectives
Students will:
0929.7.1 Establish goals for meeting children's needs.
0929.7.2 Demonstrate ways teens can help meet the care and safety needs of children.
0929.7.3 Devise ways to care for the needs of infants, toddlers and preschoolers.
0929.7.4 Demonstrate activities and techniques that stimulate children's development.

Standard 8: Careers in Nutrition and Foods
The student will examine career choices related to nutrition and foods.

Careers in Nutrition and Foods Objectives (0929.)
Students will:
0929.8.1 Explore employment opportunities and requirements in nutrition/foods.

Standard 9: Nutrition and Foods (0929.S.9)
The student will exhibit procedures for working in the foods lab in an accurate, safe and sanitary manner and practice etiquette.

Nutrition and Foods Objectives
Students will:
0929.9.1 Determine safe and sanitary ways to prepare, serve, and store food.
0929.9.2 Explain the functions and use of cooking equipment.
0929.9.3 Plan for cooperation in the lab.
0929.9.4 Demonstrate accurate measurement of food preparation ingredients.
0929.9.5 Demonstrate appropriate and courteous table manners.

Standard 10: Nutrition and Wellness (0929.S.10)
The student will determine ways to meet food and nutrition goals and to solve individual nutrition issues.

Nutrition and Wellness Objectives
Students will:
0929.10.1 Identify common nutrition/food concerns of teens.
0929.10.2 Analyze factors affecting teen food choices and assess personal food habits.
0929.10.3 Formulate nutrition goals which lead to wellness, based on current guidelines for meeting nutrition needs.
0929.10.4 Evaluate sources of nutrition information.

0929.10.5 Examine alternatives for providing weekly food intake which meets wellness goals.

Standard 11: Teen Nutrition Concerns and Issues (0929.S.11)
The student will analyze alternative solutions to teen nutrition issues.

Teen Nutrition Concerns and Issues Objectives
Students will:
0929.11.1 Explain consequences of alternatives related to various nutrition issues and make judgments about appropriate courses of action.

Standard 12: Careers in Money Management and Consumer Economics (0929.S.12)
The student will identify career opportunities in money management and consumer economics.

Careers in Money Management and Consumer Economics Objectives
Students will:
0929.12.1 Describe career opportunities in money management and consumer economics.

Standard 13: Analyze Strategies (0929.S.13)
The student will analyze strategies used by sellers and plan consumer strategies which maximize resource use.

Analyze Strategies Objectives
Students will:
0929.13.1 Determine products and services commonly purchased by teens.
0929.13.2 Explore needs, wants and values common to teens and tell how these affect consumer decisions.
0929.13.3 Demonstrate strategies used by sellers to increase sales and provide product information.
0929.13.4 Exhibit buymanship skills useful in managing resources.
0929.13.5 Compare consumer rights with consumer responsibilities, cite ways laws protect consumers and identify other sources of consumer information.
0929.13.6 Explain ways ecological needs affect consumer goals and plan ways to promote ecology through purchasing.

Standard 14: Financial Planning (0929.S.14)
The student will determine ways to plan financial resource use.

Financial Planning Objectives
Students will:
0929.14.1 Identify teen money management concerns.
0929.14.2 Explain how the availability of human, material, and time resources affect consumer decisions.
0929.14.3 Weigh the alternatives for obtaining income as a teen.
0929.14.4 Identify personal expenditure needs throughout high school.
0929.14.5 Make a plan for personal income, expenses and savings.
0929.14.6 Given teen money management problems, weigh alternatives and suggest a course of action.

Standard 15: Careers in Personal and Family Relationships. (0929.S.15)
The student will analyze career choices in personal and family relationships.

Careers in Personal and Family Relationships Objectives
Students will:
0929.15.1 Research careers related to personal and family relationships.
0929.15.2 Analyze the effect of relationship skills on job success.

Standard 16: Relationships Formulation (0929.S.16)
The student will analyze relationship skills which form the basis for all relationships.

Relationships Formulation Objectives
Students will:
0929.16.1 Identify personal concerns regarding building and maintaining relationships.
0929.16.2 Analyze ways to form a more realistic self-concept and to build self-esteem.
0929.16.3 Demonstrate verbal and non-verbal communication that enhances relationships.
0929.16.4 Explain skills that are important in developing good relationships with other persons.

Standard 17: Personal Relationships (0929.S.17)
The student will suggest solutions for problems related to friendship and dating.

Personal Relationships Objectives
Students will:
0929.17.1 Summarize characteristics which build lasting friendships.
0929.17.2 Compare dating and friendship.
0929.17.3 Analyze problems related to friendships and dating, suggest solutions and evaluate suggestions.

Standard 18: Family Problems (0929.S.18)
The student will analyze family relationship problems and suggest a course of action.

Family Problems Objectives
Students will:
0929.18.1 Identify common family relationship concerns of teens.
0929.18.2 Describe ways family forms may differ throughout the family life cycle.
0929.18.3 Explain the functions of a family to its members and to society.
0929.18.4 Explain factors which affect relationships in families.
0929.18.5 Plan ways family members can share and exchange roles within a family.
0929.18.6 Given problem situations, suggest solutions and evaluate.

Standard 19: Career Relating to Teen Issues (0929.S.19)
The student will identify career opportunities related to teen issues.

Career Relating to Teen Issues Objectives
Students will:
0929.19.1 Investigate job opportunities related to teen issues and steps teens can take to control their career futures.

Standard 20: Teen Issues (0929.S.20)
The student will analyze teen issues and suggest solutions for problems experienced by teens.

Teen Issues Objectives
Students will:
0929.20.1 Analyze teen independence/interdependence and explain the meaning of "taking control of life."
0929.20.2 Analyze alternatives for coping with teen issues.
0929.20.3 Analyze issues affecting teens to determine nature, symptoms and effects of issues and suggest alternatives for coping with the issues.
0929.20.4 Given examples of problems related to teen issues, suggest a solution and justify the choice.

Standard 21: Careers in Clothing/Textiles (0929.S.21)
The student will identify career options in clothing/textiles.

Careers in Clothing/Textiles Objectives
Students will:
0929.21.1 Determine career opportunities in clothing and textiles.

Standard 22: Clothing and Textiles (0929.S.22)
The student will develop knowledge in selecting and caring for their wardrobe.

Clothing and Textiles Objectives
Students will:
0929.22.1 Explain clothing concerns of teens.
0929.22.2 Identify motivations for clothing selection.
0929.22.3 Examine personal clothing goals.
0929.22.4 Given clothing selection situations, make judgments based on source, quality and fabric.
0929.22.5 Construct a simple project using accepted practice for equipment use and construction techniques.
0929.22.6 Practice procedures for storing and repairing clothing which promote a neat appearance and longer clothing use.
0929.22.7 Given clothing labels, determine the type of cleaning needed.
0929.22.8 Determine laundry procedures and describe ways family members can share laundry responsibilities.

Applied Design-Housing/Interior Design

This course will provide students with the skills and practices that are required for the application of design elements and principles in the areas of housing.

Standard 1: Design Elements and Principles (0941.S.1)
The student will pursue the knowledge, skill and practices required for the application of design elements and principles in the areas of housing.

Design Elements and Principles Objectives
Students will:
0941.1.1 Determine and apply the elements and principles of design.
0941.1.2 Analyze the effects that elements and principles of design have on aesthetics and function.
0941.1.3 Predict the psychological impact that the principles and elements have on individuals and families.
0941.1.4 Demonstrate knowledge of cultural influences upon design.
0941.1.5 Explore the use of current technology to facilitate design.
0941.1.6 Use a variety of equipment, tools, supplies, and techniques in the design process.
0941.1.7 Demonstrate design skills.
0941.1.8 Demonstrate design ideas through visual presentations.

Standard 2: Customer Service/Business Profitability (0941.S.2)
The student will be able to demonstrate "Customer Service/Business Profitability.

Customer Service/Business Profitability Objectives
Students will:
0941.2.1 Demonstrate effective communication skills.
0941.2.2 Evaluate the components of customer service.
0941.2.3 Analyze the merchandising of design products.
0941.2.4 Examine responsibilities, liabilities, and legislation related to safety, security, and environmental factors.

Standard 3: Textiles (0941.S.3)
The student will explore the many areas of textiles

Textiles Objectives
Students will:
0941.3.1 Identify, compare, and analyze the most common textile fibers.
0941.3.2 Predict the effects of textile characteristics on design, construction and use.
0941.3.3 Select appropriate procedures for care and maintenance of textile products/apparel.
0941.3.4 Examine textile legislation, standards, and labeling in the global economy.
0941.3.5 Demonstrate textile design skill.
0941.3.6 Evaluate career paths within the textile industry.

Standard 4: Housing/Interior Design (0941.S.4)
The student will examine the many areas of Housing/Interior Design.

Housing/Interior Design Objectives
Students will:
0941.4.1 Evaluate career paths within the interior design, housing, and home furnishings industry.
0941.4.2 Evaluate the needs, goals, and resources in creating design plans and/or acquiring housing.
0941.4.3 Analyze influences on architectural and furniture design and development.
0941.4.4 Evaluate the use of housing and interiors furnishings and products to relate to

specific design needs.

0941.4.5 Demonstrate the use of technology and other skills required for the housing, interiors and furnishings industry.

0941.4.6 Analyze major components of a home's structure.

0941.4.7 Evaluate exterior and interior materials and products used in construction.

Food Preparation

The student will focus on various food preparation and management skills that promotes health and wellness of individuals and families.

Standard 1: Safety, Sanitation & Storage (0951.S.1)
The student will demonstrate safety, sanitation and food storage procedures.

Safety, Sanitation & Storage Objectives
Students will:
0951.1.1 Practice acceptable personal hygiene.
0951.1.2 Analyze food-borne illnesses.
0951.1.3 Identify and use proper sanitation habits and safety/first-aid procedures in food preparation and storage.

Standard 2: Abbreviations and Equivalents (0951.S.2)
The student will identify and interpret food preparation abbreviations and equivalents.

Abbreviations and Equivalents Objectives
Students will:
0951.2.1 Identify and correctly use abbreviations found in recipes.
0951.2.2 Identify and correctly use math equivalents and symbols common to food preparation.
0951.2.3 Determine the correct equivalents to use when manipulating recipe amounts.
0951.2.4 List kinds of information a good recipe contain.
0951.2.5 Analyze effects of increasing/decreasing a recipes yield.
0951.2.6 Examine how high altitude affects the cooking process.

Standard 3: Terms (0951.S.3)
The student will identify food preparation terms.

Terms Objectives
Students will:
0951.3.1 Identify and define food preparation terms and cookery techniques terms.
0951.3.2 Describe the importance of implementing correct food preparation terms and cookery techniques terms to successful recipe interpretation.
0951.3.3 Demonstrate assigned food preparation and techniques skills.

Standard 4: Measuring and Mixing (0951.S.4)
The student will develop correct measuring techniques.

Measuring and Mixing Objectives
Students will:
0951.4.1 Identify standard units of measure used in food preparation.
0951.4.2 Use correct math common to food preparation when translating recipes.
0951.4.3 Identify and demonstrate the correct measuring equipment for both liquid and dry ingredients.
0951.4.4 Evaluate the importance of exact measurements of ingredients when cooking and baking.

Standard 5: Equipment (0951.S.5)
The student will identify large and small food preparation equipment.

Equipment Objectives
Students will:
0951.5.1 Recognize large and small kitchen equipment.
0951.5.2 Demonstrate safe use and care of all kitchen equipment.
0951.5.3 Identify, select, use and care for equipment used in the preparation of food.

0951.5.4 Improvise for equipment that is not available.
0951.5.5 Compare microwave cooking to conventional cooking.
0951.5.6 Demonstrate safety precautions and care for microwave oven usage.
0951.5.7 Analyze cooking techniques and utensils used for successful microwave cooking.
0951.5.8 Identify factors affecting microwave cooking time.

Standard 6: Utensils (0951.S.6)
The student will identify kitchen utensils.

Utensils Objectives
Students will:
0951.6.1 Identify small kitchen utensils, their uses and care.
0951.6.2 Demonstrate proper use and care of small kitchen utensils in preparation of assigned recipes.

Standard 7: Table Setting and Etiquette (0951.S.7)
The student will practice table setting and etiquette.

Table Setting and Etiquette Objectives
Students will:
0951.7.1 Research table etiquette guidelines.
0951.7.2 Research table etiquette guidelines for different ethnical groups.
0951.7.3 Demonstrate table settings for various types of meals.
0951.7.4 Practice good table manners during food preparations labs.

Standard 8: Nutrition (0951.S.8)
The student will analyze good nutrition practices.

Nutrition Objectives
Students will:
0951.8.1 Identify factors affecting an individual's nutritional needs.
0951.8.2 Relate the role of good nutrition to the health and wellness of individuals and families.
0951.8.3 Demonstrate how to conserve nutrients during food preparation.
0951.8.4 Develop a one-week menu for a family of four using the food pyramid.
0951.8.5 Research diet disorders, (i.e. bulimia, anorexia.)
0951.8.6 Analyze special needs diets, (i.e. diabetic, vegetarian, low cholesterol, etc.)

Standard 9: Cooking Labs (0951.S.9)
The student will apply food preparation techniques and skills.

Cooking Labs Objectives
Students will:
0951.9.1 Develop appropriate menus, grocery orders and timelines for cooking and/or baking labs.
0951.9.2 Prepare and compare six types of cookies.
0951.9.3 Describe the functions of ingredients, nutritive value, and methods of preparation.
0951.9.4 Evaluate products by appearance and eating quality.
0951.9.5 Interpret general information about quick breads and methods of preparation.
0951.9.6 Prepare the following quick breads: biscuits, muffins, pancakes, and loaf breads.
0951.9.7 Evaluate how ingredients function in different products.
0951.9.8 Explain the grading of eggs.
0951.9.9 Draw and label the structure of eggs.
0951.9.10 Describe the functions of eggs in food preparation.
0951.9.11 Prepare fruits and vegetables recipes.
0951.9.12 Prepare dairy products and egg recipes.
0951.9.13 Prepare pasta and potato products recipes.
0951.9.14 Prepare Garde Manger items.
0951.9.15 Supervise kitchen staff as a head cook.

0951.9.16 Classify and choose spices, herbs, and extracts to enhance the flavors in foods.
0951.9.17 Select, prepare, and serve a dish of the students' choice.

Nutrition and Food Science

Nutrition courses focus on the value of good nutrition in relationship to wellness. Students use scientific processes to study the field of food science. Laboratory skills and experimental methods are used to measure, record and analyze data that relate to the relationship of food science to other sciences (such as chemistry, microbiology, nutrition and physics).

Standard 1: Nutritional Content
The student will evaluate the nutritional content of food to promote individual and family wellness across the life span.

Nutritional Content Objectives
Students will:
0952.1.1 Evaluate the nutritional content of food in relation to the health and wellness needs of individuals and families.
0952.1.2 Using technology, analyze personal eating habits and plan ways to choose food to meet nutritional goals.
0952.1.3 Identify factors, facts, and fallacies that affect wellness.
0952.1.4 Evaluate the use of supplements to meet daily nutritional needs.

Standard 2: Six Basic Nutrients (0952.S.2)
The student will interpret information regarding the six basic nutrients to promote health and wellness.

Six Basic Nutrients Objectives
Students will:
0952.2.1 Identify the functions, food sources, and excess/inadequate amounts of the six major nutrients.
0952.2.2 Explain the process of food digestion and nutrient absorption.
0952.2.3 Examine the properties of each of the six basic nutrients.

Standard 3: Food Preparation Techniques (0952.S.3)
The student will demonstrate planning, selecting, storing, preparing and serving of foods to meet nutritional needs of individuals and families across the life span.

Food Preparation Techniques Objectives
Students will:
0952.3.1 Compare food purchasing options according to cost and nutritional quality.
0952.3.2 Identify meal planning strategies for different stages of the family life cycle.
0952.3.3 Plan, prepare, and store food to achieve nutritional goals.
0952.3.4 Explain how to choose and handle food to preserve nutrition, quality, and safety.
0952.3.5 Explore techniques of food preservation.

Standard 4: Food Safety (0952.S.4)
The student will demonstrate food safety and sanitation practices for handling food.

Food Safety Objectives
Students will:
0952.4.1 Identify potential health problems related to food supply.
0952.4.2 Identify sanitary and food handling practices that can help prevent food spoilage.
0952.4.3 Describe the properties of the microorganisms that cause food spoilage.
0952.4.4 Describe safety guidelines.

Standard 5: Nutritional Factors (0952.S.5)
The student will analyze the internal and external factors that influence nutritional practices and wellness across the life span.

Nutritional Factors Objectives
Students will:
0952.5.1 Examine the nutritional needs and food patterns of various age groups.
0952.5.2 Research nutrition and the athlete.
0952.5.3 Research specialty diets (vegetarian, diabetic, fad diets, etc.).
0952.5.4 Describe how food choices are influenced by available resources and technology.

Standard 6: Product Labels (0952.S.6)
The student will analyze information on product labels.

Product Labels Objectives
Students will:
0952.6.1 Compare foods as to nutritional content and serving size.
0952.6.2 Examine and interpret food labels.

Standard 7: Food Trends (0952.S.7)
The student will analyze behaviors and food industry trends.

Food Trends Objectives
Students will:
0952.7.1 Describe techniques for successful weight control methods.
0952.7.2 Analyze effects of eating disorders.
0952.7.3 Research solutions to reduce calories, increase fiber, reduce sugar, reduce fat, increase complex carbohydrates, etc.
0952.7.4 Identify practical ways to change eating habits.
0952.7.5 Evaluate the use of supplements to meet daily nutritional needs.
0952.7.6 Analyze the metabolic process.
0952.7.7 Examine the issue of diet versus disease prevention (birth defects, cardiovascular, hypertension, etc.)

Standard 8: Food Science Concepts (0952.S.8)
The student will apply the steps in the scientific method to examine basic food science concepts.

Food Science Concepts Objectives
Students will:
0952.8.1 Identify scientific equipment used in the food science industry.
0952.8.2 Explain the steps in the scientific method.
0952.8.3 Write accurate and complete reports of food science experiments.
0952.8.4 Identify basic science concepts.
0952.8.5 Explore basic energy concepts.
0952.8.6 Examine acid and bases.
0952.8.7 Explore experimentation in food science.

Standard 9: Food Science Careers (0952.S.9)
The student will research careers in the nutrition and food science areas.

Food Science Careers Objectives
Students will:
0952.9.1 Identify entry level and advanced level careers in nutrition and food sciences.
0952.9.2 Examine education and training needed for a career in nutrition and food science.
0952.9.3 Explore emerging careers in nutrition, food science, and biotechnology.

Applied Design-Fashion Merchandising

This course will provide students with the skills and practices that are required for the application of design elements and principles in the areas of fashion.

Standard 1: Design Elements and Principles (0961.S.1)
The student will pursue the knowledge, skill and practices required for the application of design elements and principles in the areas of fashion.

Design Elements and Principles Objectives
Students will:
0961.1.1 Determine and apply the elements and principles of design.
0961.1.2 Analyze the effects that elements and principles of design have on aesthetics and function.
0961.1.3 Predict the psychological impact that the principles and elements have on individuals and families.
0961.1.4 Demonstrate knowledge of cultural influences upon design.
0961.1.5 Explore the use of current technology to facilitate design.
0961.1.6 Use a variety of equipment, tools, supplies, and techniques in the design process.
0961.1.7 Demonstrate design skills.
0961.1.8 Demonstrate design ideas through visual presentations.

Standard 2: Customer Service/Business Profitability (0961.S.2)
The student will demonstrate customer service and business profitability skills.

Customer Service/Business Profitability Objectives
Students will:
0961.2.1 Demonstrate effective communication skills.
0961.2.2 Evaluate the components of customer service.
0961.2.3 Analyze the merchandising of design products.
0961.2.4 Examine responsibilities, liabilities, and legislation related to safety, security, and environmental factors.

Standard 3: Textiles (0961.S.3)
The student will explore the many areas of textiles.

Textiles Objectives
Students will:
0961.3.1 Identify, compare, and analyze the most common textile fibers.
0961.3.2 Predict the effects of textile characteristics on design, construction and use.
0961.3.3 Select appropriate procedures for care and maintenance of textile products/apparel.
0961.3.4 Examine textile legislation, standards, and labeling in the global economy.
0961.3.5 Demonstrate textile design skill.
0961.3.6 Evaluate career paths within the textile industry.

Standard 4: Apparel (0961.S.4)
The student will examine the area of apparel and apply related principles to it.

Apparel Objectives
Students will:
0961.4.1 Evaluate factors that influence clothing design and choices.
0961.4.2 Judge the role of value, quality, and fit in wardrobe selection.
0961.4.3 Evaluate shopping options.
0961.4.4 Demonstrate ability to use technology for fashion design.
0961.4.5 Demonstrate construction techniques used to produce and repair apparel.

0961.4.6 Determine opportunities and preparation requirements for different levels of employment within the apparel industry.

Performance Descriptors (0961.PD.1-4):

- **Distinguished**
  The student has demonstrated mastery of the Standards and Objectives of this course with minimal supervision.

- **Mastery**
  The student has demonstrated mastery of the Standards and Objectives of this course with occasional supervision.

- **Partial Mastery**
  The student has demonstrated mastery of the Standards and Objectives of this course with frequent supervision.

Dental Assisting I

This area of study is comprised of components designed to prepare an individual to function as an integral member of the dental health team and to perform the basic duties of a chairside assistant. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Careers in Dental Assisting (0701.S.1)
Students will research various opportunities for a career in Dental Assisting.

Careers in Dental Assisting Objectives
Students will:
0701,1.1 Describe the primary roles and responsibilities of a dental assistant.
0701,1.2 Explain the relevant safety practices and procedures for dental assisting.
0701,1.3 Discuss the various dental specialty areas that employ dental assistants.
0701,1.4 Discuss educational and career benefits available for dental assistants.
0701,1.5 Identify the importance of ethical practices in the dental office environment.
0701,1.6 Associate health and grooming habits with successful employment as a dental assistant.

Standard 2: Communication (0701.S.2)
Students will demonstrate professional communication skills.

Communication Objectives
Students will:
0701.2.1 Demonstrate the ability to recognize nonverbal communication signals.
0701.2.2 Describe techniques of skillful listening and discuss their importance in communication.
0701.2.3 Explain how courtesy, tact, poise, discretion, and integrity are utilized in communication.
0701.2.4 Utilize effective communication techniques to demonstrate oral hygiene to patients.
0701.2.5 Identify methods of dealing with fears and anxieties of patients.
0701.2.6 Demonstrate correct telephone manner and technique.

Standard 3: Head and Neck Anatomy (0701.S.3)
Students will describe head and neck anatomy.

Effective Head and Neck Anatomy Objectives
Students will:
0701.3.1 Name and describe the purpose of the landmarks of both mandible and maxilla.
0701.3.2 Locate each landmark on an unlabeled drawing.
0701.3.3 Identify the origin, insertion, and action of each muscle of mastication.
0701.3.4 Locate each muscle of mastication on an unlabeled drawing.
0701.3.5 Label paranasal sinuses on a diagram.
0701.3.6 Locate and examine the three major salivary glands and their associated ducts.
0701.3.7 Describe the functions and location of nerves of the head and neck as associated with anesthesia.
0701.3.8 Discuss the properties of local anesthesia and differentiate between block and infiltration injection.
0701.3.9 Demonstrate and explain charting and treatment of an allergic reaction to anesthesia.
0701.3.10 Prepare an anesthetic aspirating syringe for the administration of local anesthesia.
0701.3.11 Disassemble an anesthetic aspirating syringe for sterilization.

Standard 4: Oral Anatomy (0701.S.4)
Students will identify structures and landmarks of the oral cavity and interpret various charting techniques.

Oral Anatomy Objectives
Students will:

0701.4.1	Name the landmarks of the oral cavity and describe their function.
0701.4.2	Label a drawing of all the landmarks of the oral cavity.
0701.4.3	Describe and identify the parts, tissues and functions of each tooth.
0701.4.4	Identify and describe the functions of the supporting structures of the tooth.
0701.4.5	Name the primary and permanent teeth and list the approximate age of eruption.
0701.4.6	Describe the surfaces of each tooth and the abbreviation used for each surface.
0701.4.7	Label deciduous and permanent teeth using the universal numbering system.
0701.4.8	Demonstrate an awareness of different charting techniques including classifications of caries.

Standard 5: Disease Transmission and Prevention (0701.S.5)
Students will describe and practice principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:

0701.5.1	Define, pronounce and spell terminology as related to microbiology, bacteriology, and sterilization.
0701.5.2	Examine the conditions necessary for microorganisms to grow.
0701.5.3	Recognize the cycle of microorganism transmission and prevention.
0701.5.4	Demonstrate knowledge and application of "Standard Precautions".
0701.5.5	Demonstrate proper handwashing technique.

Standard 6: Emergency Medical Care (0701.S.6)
Students will identify the need for and perform basic emergency medical care.

Emergency Medical Care Objectives
Students will:

0701.6.1	Distinguish the four priorities of first aid.
0701.6.2	Explain first aid measures, including symptoms for sudden illness and injury.
0701.6.3	Demonstrate the four methods for the control of bleeding in proper order.
0701.6.4	State the role of the assistant in the administration of oxygen.
0701.6.5	Secure certification for adult, child and infant CPR and choking from American Red Cross or American Heart Association.
0701.6.6	Recognize general characteristics of temperature, pulse, respiration and blood pressure.
0701.6.7	Identify the instruments used to measure vital signs.
0701.6.8	Measure, record and interpret vital signs.

Standard 7: Preventative Dentistry (0701.S.7)
Students will recognize causes, symptoms and treatment for various conditions of the oral cavity related to oral hygiene.

Preventative Dentistry Objectives
Students will:

0701.7.1	State various conditions in the mouth that indicate poor oral hygiene.
0701.7.2	Demonstrate an understanding of proper oral hygiene techniques.
0701.7.3	List and describe the properties of each type of fluoride agent and explain its use.
0701.7.4	Describe the process of applying a topical fluoride agent.
0701.7.5	State the purpose of using a pit and fissure sealant and describe the application process.

Standard 8: Fundamentals of Chairside Assisting (0701.S.8)
Students will associate appropriate materials and instruments with various operative procedures.

Fundamentals of Chairside Assisting Objectives
Students will:

0701.8.1	Identify types, characteristics and uses of hand cutting instruments.
0701.8.2	Identify classifications of handpieces, component parts and their uses.
0701.8.3	Identify types, characteristics and purposes of dental burs.
0701.8.4	List instruments and supplies for various operative procedures.
0701.8.5	Describe types of bases and liners and their principal and secondary use.
0701.8.6	Prepare, measure and mix various bases and liners.
0701.8.7	Describe amalgam composition and explain the safety principles of mercury.
0701.8.8	Show proper technique for mixing and handling amalgam.
0701.8.9	Describe the composite composition and explain the safe use of a high intensity light.
0701.8.10	Tell the steps for various operative procedures.
0701.8.11	Position patient, dentist and assistant for four-handed operative dentistry.
0701.8.12	Interpret various instrument grasps to exchange and retrieve instruments.
0701.8.13	Demonstrate proper use of evacuator, water and air during dental procedures.

Standard 9: Technology (0701.S.9)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:

0701.9.1	Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0701.9.2	Utilize the internet as a resource/research tool.

Standard 10: Student Organization
Students will participate in a Career and Technical Organization (CTSO).

Critical Student Organization Objectives (0701.S.10)
Students will:

0701.10.1	Participate in Health Occupations Students of American (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0701.10.2	Apply parliamentary procedure in organizational meetings.
0701.10.3	Demonstrate team membership skills, such as cooperation and leadership.
0701.10.4	Take part in local, state, and national health care and education projects.

Dental Assisting II

This area of study is comprised of courses designed to prepare an individual to function as a chairside assistant and to perform related office and laboratory procedures under the direction and supervision of the dentist. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Radiation Safety (0702.S.1)
Students will describe radiation safety for the patient and auxiliary personnel.

Radiation Safety Objectives
Students will:

0702.1.1	List the purposes and methods of radiation safety.
0702.1.2	Describe the dangers involved in overexposure to radiation and demonstrate proper safety.
0702.1.3	Identify characteristics of basic types of roentgen rays (x-rays).
0702.1.4	Explain the basic parts and functions of an x-ray unit.

Standard 2: Radiography Technique (0702.S.2)
Students will understand the process of exposing, processing and mounting dental radiographs.

Radiography Objectives
Students will:

0702.2.1	Match facial landmarks associated with roentgenology to the correct definitions.
0702.2.2	Distinguish between intraoral and extraoral radiographic film and describe proper storage of each.
0702.2.3	Explain the film requirements for a full mouth series of radiographs for adults and children.
0702.2.4	Differentiate between periapical and bitewing radiographs.
0702.2.5	Identify oral landmarks associated with periapical radiographs.
0702.2.6	Assemble XCP (X-Tension Cone Paralleling) instrument for periapical and bitewing radiographs.
0702.2.7	Arrange in order the steps to take during radiographic exposure.
0702.2.8	Discuss methods and materials used in developing radiographs.
0702.2.9	Develop, mount and file radiographs.
0702.2.10	Evaluate dental radiographs for diagnostic quality.

Standard 3: Secretarial Procedures (0702.S.3)
Students will perform fundamental secretarial procedures.

Secretarial Procedures Objectives
Students will:

0702.3.1	Describe types of filing systems used in the dental office.
0702.3.2	List the requirements for appointment book entries and schedule appointments.
0702.3.3	Care for incoming mail.
0702.3.4	Explain the importance of a properly completed form.
0702.3.5	Complete registration and health history records.

Standard 4: Accounting Procedures (0702.S.4)
Students will perform fundamental accounting procedures.

Accounting Procedures Objectives
Students will:

0702.4.1	Discuss accounting systems used in a dental office.
0702.4.2	Practice accounting, complete a ledger card, receipts, and balance a daily journal page.
0702.4.3	Explain the purpose of a petty cash fund and describe the handling of petty cash.
0702.4.4	Prepare a bank deposit.
0702.4.5	Discuss methods of maintaining a checking account and write a check.
0702.4.6	State points to remember when handling insurance claims and list basic information found on a claim form.
0702.4.7	Complete a dental insurance form.
0702.4.8	Discuss basic dental computer applications.

Standard 5: Dental Health Team (0702.S.5)
Students will demonstrate the ability to work as an effective member of a dental health team.

Dental Health Team Objectives
Students will:

0702.5.1	Display proper communication techniques while serving as a member of the dental health team.
0702.5.2	Display proper grooming techniques while serving as a member of the dental health team.
0702.5.3	Perform various roles of a dental health team member.
0702.5.4	Given various situations use brainstorming techniques to solve dental health team problems.
0702.5.5	Given various scenarios demonstrate proper ethical decision making skills as related to dental health problems.

Standard 6: Chairside Assisting II (0702.S.6)
Students will assist in four-handed dental procedures and perform other chairside duties.

Chairside Assisting II Objectives
Students will:

0702.6.1	Assist with various four-handed operative procedures.
0702.6.2	Describe the process and assist with the placement of a rubber dam.
0702.6.3	Identify and describe the function of instruments used in each dental specialty.
0702.6.4	Discuss the process of preparing and placing dental matrices.

Standard 7: Dental Materials (0702.S.7)
Students will manipulate dental materials used for various dental procedures.

Dental Materials Objectives
Students will:

0702.7.1	Describe types of cements and their principal and secondary use.
0702.7.2	Prepare, measure and mix various dental cements for luting.
0702.7.3	Discuss the physical and chemical properties of alginate impression material.
0702.7.4	Prepare, mix and place maxillary and mandibular alginate impressions.
0702.7.5	Discuss properties of gypsum materials and their uses.
0702.7.6	Mix and pour gypsum materials into prepared alginate impressions.
0702.7.7	Trim maxillary and mandibular models according to specifications.

Standard 8: Technology (0702.S.8)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:

0702.8.1 Integrate the use of software, hardware, and the Internet to practice and master standards identified in the course.

0702.8.2 Utilize the Internet as a resource/research tool.

Standard 9: Student Organization (0702.S.9)
Students will participate in a Career and Technical Organization (CTSO).

Critical Student Organization Objectives
Students will:

0702.9.1 Participate in Health Occupations Students of American (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (SkillsUSA/VICA).

0702.9.2 Apply parliamentary procedure in organizational meetings.

0702.9.3 Demonstrate team membership skills, such as cooperation and leadership.

0702.9.4 Take part in local, state, and national health care and education projects.

Health Care Fundamentals

The Health Occupations Education student will be introduced to information about health care systems and careers. Information is included on recognition of disease transmission and prevention and the prevention of disease utilizing good nutrition. Students will analyze stages of growth and development and examine human needs. Emphasis will be placed on analyzing and interpreting medical terminology with a focus on medical elements. Students are provided the opportunity to acquire First Aid and CPR certification and are encouraged to affiliate with a Career and Technical Student Organization (CTSO).

Standard 1: Health Care Systems (0711.S.1)

Students will demonstrate knowledge of the general purposes and organization of the various types of health care systems.

Health Care Systems Objectives
Students will:
0711.1.1 Examine systems theory and construct a general systems model listing inputs, throughputs, and feedback loop.
0711.1.2 Compare and contrast health care systems delivering acute and long term care.
0711.1.3 Differentiate major government and voluntary agencies involved in the delivery of health care.
0711.1.4 Identify professional/student organizations as related to specific health care careers.
0711.1.5 Define common terms and abbreviations associated with payment classifications and health insurance plans.
0711.1.6 Distinguish lines of authority or chain of command in a typical health care facility or agency.

Standard 2: Careers (0711.S.2)
Students will research careers in health care systems.

Career Objectives
Students will:
0711.2.1 Research and analyze the duties, educational requirements and employment opportunities of at least ten different health careers.
0711.2.2 Contrast the differences between certification, registration and licensure.
0711.2.3 Research at least one health career by observing or interviewing an individual employed in that field or by requesting information from resources.
0711.2.4 Recognize and interpret at least ten abbreviations used to identify health occupation workers.
0711.2.5 Define, pronounce and spell key terms related to careers in health care.

Standard 3: Disease Transmission and Prevention
Students will demonstrate knowledge of principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:
0711.3.1 Examine the conditions necessary for microorganisms to grow.
0711.3.2 Recognize the cycle of microorganism transmission and prevention.
0711.3.3 Perform proper hand washing technique.
0711.3.4 Demonstrate knowledge of standard precautions.

Standard 4: Human Growth and Development (0711.S.4)
Students will demonstrate a knowledge of human needs/human growth and development.

Human Growth and Development Objectives
Students will:
0711.4.1 Examine and describe the basic stages of human growth and development.
0711.4.2 Identify ways in which life stages affect an individual's needs.
0711.4.3 Describe the individual's need for exercise and activity.
0711.4.4 Evaluate Maslow's Hierarchy of Needs.

0711.4.5 Analyze the five stages of grieving.

Standard 5: Nutrition (0711.S.5)
Students will demonstrate knowledge of nutrition.

Nutrition Objectives
Students will:
0711.5.1 Identify the five basic food groups and the number of daily recommended servings of each.
0711.5.2 Compare and analyze therapeutic diets.
0711.5.3 Name the six groups of essential nutrients and their functions and sources.

Standard 6: Medical Terminology (0711.S.6)
Students will demonstrate knowledge of basic medical terminology.

Medical Terminology Objectives
Students will:
0711.6.1 Define commonly used medical roots, prefixes and suffixes.
0711.6.2 Pronounce and spell commonly used medical roots, prefixes and suffixes.
0711.6.3 Match common medical roots, prefixes, and suffixes with their definitions.

Standard 7: Emergency Medical Care (0711.S.7)
Students will demonstrate knowledge and skill in performing basic emergency medical care.

Emergency Medical Care Objectives
Students will:
0711.7.1 Distinguish the four priorities of First Aid.
0711.7.2 Identify signs, symptoms, and treatment for shock.
0711.7.3 Demonstrate the four methods for the control of bleeding in the order they are used.
0711.7.4 Describe first aid treatment for wounds and the terms associated with each type.
0711.7.5 Describe first aid measures for sudden illness and injury including fainting, stroke, seizures, insulin shock and diabetic coma.
0711.7.6 Demonstrate first aid measures for bone and joint injuries including fracture, dislocation, sprain and strain.
0711.7.7 Demonstrate dressing, bandaging and splinting techniques.
0711.7.8 Recognize first aid measures used for specific injuries involving the eyes, head, nose, ears, chest, abdomen and genital organs.
0711.7.9 Describe first aid measures for temperature related injuries including hot and cold exposure and burns.
0711.7.10 Describe first aid measures for poisoning, stings, bites, and allergic reactions.
0711.7.11 Secure certification in First Aid from American Red Cross or American Heart Association.

Standard 8: CPR and First Aid for Obstructed Airway (0711.S.8)
Students will identify the need for and perform Cardiopulmonary Resuscitation and first aid for an Obstructed Airway.

CPR and First Aid for Obstructed Airway Objectives
Students will:
0711.8.1 Express the risk factors for cardiovascular disease.
0711.8.2 Perform correct CPR technique for the following: infant, child, and one-rescuer adult.
0711.8.3 Identify signs and symptoms of an obstructed airway.
0711.8.4 Identify the signs and symptoms of a heart attack.
0711.8.5 Demonstrate universal distress signal for obstructed airway.
0711.8.6 Perform procedures to relieve airway obstruction in an infant, child and adult.
0711.8.7 Demonstrate the correct use of the AED.
0711.8.8 Secure certification for adult, child and infant CPR and choking from American Red Cross or American Heart Association.

Standard 9: Technology (0711.S.9)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0711.9.1 Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0711.9.2 Utilize the internet as a resource/research tool.

Standard 10: Student Organizations (0711.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0711.10.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (Skills USA/VICA).
0711.10.2 Apply parliamentary procedure in organizational meetings.
0711.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0711.10.4 Take part in local, state, and national health care and education projects.

Supplement to Health Care Fundamentals*

The student will build on standards and objectives introduced in the Health Care Fundamentals course. Within this course students will examine such areas as goal development, critical thinking skills, effective communication, and interpersonal relationships. Utilizing computer simulations of clinical scenarios, students will enhance skills in the analytical and evaluation processes. Upon completion of course standards students will be asked to re-access their personal attitudes and goals in light of new knowledge gained. Students are encouraged to participate in a Career and Technical Student Organization (CTSO). *For health occupation education students who have enrolled at technical centers having already completed Health Care Fundaments (0711).

Standard 1: Goal Development (0713.S.1)

Students will explore self-assessment concepts in order to develop personal and professional goals.

Goal Development Objectives
Students will:

0713.1.1	Explore concepts of self-esteem, values and attitudes.
0713.1.2	Assess personal habits and attitudes.
0713.1.3	Identify professional characteristics necessary for employment in the health care industry.
0713.1.4	Examine the goal setting process.
0713.1.5	Formulate an action plan to achieve personal and academic goals.
0713.1.6	Summarize the importance of time management.

Standard 2: Analytical Skills (0713.S.2)
Students will analyze and evaluate information utilizing clinical simulations.

Analytical Skills Objectives
Students will:

0713.2.1	Analyze clinical scenarios in a critical, objective manner.
0713.2.2	Examine workplace related issues utilizing clinical scenarios.
0713.2.3	Integrate scenario outcomes as they relate to the workplace environment.

Standard 3: Critical Thinking (0713.S.3)
Students will demonstrate effective use of critical thinking skills in the personal decision making process.

Critical Thinking Objectives
Students will:

0713.3.1	Define cognitive processing.
0713.3.2	Examine the different types of thinking.
0713.3.3	Compare and contrast inductive and deductive reasoning.
0713.3.4	Integrate critical thinking skills into personal decision-making.

Standard 4: Effective Communication (0713.S.4)
Students will demonstrate appropriate communication skills in various health care settings.

Effective Communication Objectives
Students will:

0713.4.1	Define methods to improve verbal and nonverbal communication.
0713.4.2	Explore health care consumer-related communication.
0713.4.3	Identify the physical and mental characteristics of listening.
0713.4.4	Create written documentation based on interpretation of clinical scenarios.

Standard 5: Interpersonal Relationships (0713.S.5)
Students will examine elements affecting patient interaction, interpersonal relationships and group dynamics.

Interpersonal Relationships Objectives
Students will:

0713.5.1	Explore the principles of teamwork.
0713.5.2	Summarize factors that affect group dynamics.
0713.5.3	Demonstrate group leadership techniques.
0713.5.4	Identify the steps involved in patient interaction.
0713.5.5	Discuss the relationship between communication and territorial space.

Standard 6: Personal Achievement Assessment (0713.S.6)
Students will re-examine personal attitudes and goals based on newly acquired information.

Personal Achievement Evaluation Objectives
Students will:

0713.6.1	Relate acquired knowledge to potential career success.
0713.6.2	Modify personal goals to reflect mastery of standards.

Standard 7: Technology (0713.S.7)
Students will assess and use electronically produced information to master course standards.

Technology Objectives
Students will:

0713.7.1	Integrate the use of software, hardware and the internet to practice and master standards identified in the course.
0713.7.2	Utilize the internet as a resource and research tool.

Standard 8: Student Organizations (0713.S.8)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:

0713.8.1	Participate in Health Occupations Students of America (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (SkillsUSA/VICA).
0713.8.2	Apply parliamentary procedure in organizational meetings.
0713.8.3	Demonstrate team membership skills, such as cooperation and leadership.
0713.8.4	Take part in local, state, and national health care and education projects.

Concepts Of Health Care

The Health Care Student will be introduced to the personal qualities and communication skills needed to work successfully in a health care setting. The course also integrates advanced medical terminology, building upon basic terminology from the fundamentals course. Major areas of study are the legal and ethical responsibilities of health care workers, patients' rights and legal directives, measurement and assessment, and fundamental math principles used in health care services. Students are encouraged to participate in a Career and Technical Student Organization (CTSO) as part of the course.

Standard 1: Personal Qualities (0715.S.1)
Students will demonstrate awareness of personal qualities as they relate to success as a health care worker.

Personal Qualities Objectives
Students will:
0715.1.1 Describe at least eight personal traits or attitudes desirable in the health care worker.
0715.1.2 Examine basic professional standards of the health care worker as they apply to hygiene, dress, language, confidentiality and behavior.
0715.1.3 Compare the relationship among values, attitudes and behavior.
0715.1.4 Define, pronounce and spell key terms related to personal qualities of the health care worker.

Standard 2: Health Care Consumer (0715.S.2)
Students will demonstrate knowledge of variables that impact the individual health care consumer.

Health Care Consumer Objectives
Students will:
0715.2.1 Compare and contrast health and illness.
0715.2.2 Summarize factors which influence consumer attitudes and use of available health care services.

Standard 3: Communicating Observations (0715.S.3)
Students will apply proper procedures for communicating observations.

Communicating Observation Objectives
Students will:
0715.3.1 Differentiate between subjective and objective reporting.
0715.3.2 Discuss the role of the health care worker in gathering information and in making observations.
0715.3.3 Identify the reasons why observations must be reported promptly, accurately, and objectively.

Standard 4: Communication Skills (0715.S.4)
Students will demonstrate knowledge of effective communication skills in listening, speaking and writing.

Communication skills objectives
Students will:
0715.4.1 Convey and follow multi-step verbal directions.
0715.4.2 Participate in and lead group discussions.
0715.4.3 Organize ideas in an understandable format to plan written or oral communications.
0715.4.4 Compose sentences using correct punctuation and grammar.
0715.4.5 Describe ways one can maintain a courteous and professional approach toward patients/residents, families, the health care team, and the public.
0715.4.6 Differentiate basic principles of therapeutic communication.
0715.4.7 Utilize the three essential elements of effective communication.

0715.4.8 Apply appropriate telephone etiquette in answering the telephone and in recording messages.
0715.4.9 Assess alternate methods of communication with the hearing, vision, or speech impaired.

Standard 5: Medical Terminology (0715.S.5)
Students will demonstrate knowledge of advanced medical terminology.

Medical Terminology Objectives
Students will:
0715.5.1 Interpret common medical terms.
0715.5.2 Incorporate standard medical abbreviations and terms in written communications.
0715.5.3 Pronounce and spell medical terms.
0715.5.4 Analyze and compare common medical terms with their definitions.

Standard 6: Legal Issues and Ethics (0715.S.6)
Students will demonstrate knowledge of legal responsibilities and ethics in the health care setting.

Legal Issues and Ethics Objectives
Students will:
0715.6.1 Define, pronounce and spell common terms related to legal responsibilities and ethics in health care.
0715.6.2 Analyze privileged communications and explain how they apply to health care.
0715.6.3 Summarize and apply resident's/patient's bill of rights.
0715.6.4 Detect violations of resident's/patient's bill of rights.
0715.6.5 Differentiate between laws and ethics as related to health care.
0715.6.6 Examine basic professional standards as a safeguard for the health care worker, the employer and the client/resident/patient.
0715.6.7 Explain the concept of operating within one's scope of practice.

Standard 7: Math (0715.S.7)
Students will manipulate mathematical skills as they relate to health care professions.

Math Objectives
Students will:
0715.7.1 Perform the computations addition, subtraction, multiplication and division.
0715.7.2 Measure and compute using integers, fractions, and decimals and convert between metric/household systems.
0715.7.3 Solve problems involving ratio and proportions.
0715.7.4 Select and analyze appropriate diagrams, charts, graphs and tables to plot information.

Standard 8: Measurement and Assessment (0715.S.8)
Students will demonstrate knowledge and skill in measurement and assessment.

Measurement and Assessment Objectives
Students will:
0715.8.1 Describe the four main vital signs.
0715.8.2 Assess and compare the normal ranges for vital signs.
0715.8.3 Utilize appropriate supplies and equipment for measuring vital signs.
0715.8.4 Measure and record vital signs.
0715.8.5 Recognize and report abnormal vital signs.
0715.8.6 Relate vital signs to disease processes.
0715.8.7 Measure and record results of procedures such as height and weight, vital signs, intake and output, and circumference using appropriate mathematical calculations.
0715.8.8 Analyze and interpret diagrams, charts, graphs and tables.

Standard 9: Technology (0715.S.9)
Students will access and use electronically produced information to master course standards.

Technology Objectives
Students will:
0715.9.1 Use software and hardware to practice and master standards identified in the course.
0715.9.2 Use the Internet as a resource/research tool.

Standard 10: Student Organizations (0715.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0715.10.1 Participate in Health Occupations Students of America (HOSA) or Skills USA/ Vocational Industrial Clubs of America (Skills USA/VICA).
0715.10.2 Apply parliamentary procedure in organizational meetings.
0715.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0715.10.4 Take part in local, state and national health care and education projects.

Clinical Concepts*

Students will be introduced to safe work practices for the prevention of illness or injury to clients, co-workers, and self. The course includes a study of the basic structures and major functions of the human body and common disorders associated with each body system. Also included is instruction on disease transmission/prevention, standard precautions, OSHA standards, and principles of sterile technique. In this course, students begin study in a specialized occupational area and build a foundation for more complex and correlated clinical practice within Diversified Clinical Applications (0719). Students are encouraged to participate in a Career and Technical Students Organization (CTSO). *For students desiring preparation for an entry level occupation in health care and who plan to enroll in Diversified Clinical Applications (0719).

Standard 1: Fire Safety (0717.S.1)
Students will demonstrate knowledge of fire safety in the clinical areas.

Fire Safety Objectives
Students will:
0717.1.1 Identify components necessary for the ignition of a fire.
0717.1.2 Demonstrate the proper use of the fire extinguisher.
0717.1.3 Analyze methods to prevent fire and electrical hazards.
0717.1.4 Follow emergency procedures and protocols.

Standard 2: Environmental Safety (0717.S.2)
Students will demonstrate knowledge of environmental safety hazards in the clinical setting.

Safety Objectives
Students will:
0717.2.1 Identify common safety hazards in health care facilities.
0717.2.2 Describe common equipment associated with accidents and methods of prevention.
0717.2.3 Identify routine precautions to be used in oxygen therapy.
0717.2.4 Interpret guidelines in the use of patient/resident safety devices.

Standard 3: Body Mechanics (0717.S.3)
Students will demonstrate knowledge and skill in the use of body mechanics.

Body Mechanics Objectives
Students will:
0717.3.1 Define terms related to body mechanics.
0717.3.2 Apply principles of body mechanics, such as proper lifting techniques.
0717.3.3 Choose appropriate mechanical lifting devices in given situations.
0717.3.4 Transport patient/resident by wheelchair and stretcher.
0717.3.5 Identify safety precautions to be used when positioning and transferring patient/resident.

Standard 4: Body Structure and Function (0717.S.4)
Students will demonstrate knowledge of basic structure and function for each system of the human body in health and common disorders for each.

Body Structure and Function Objectives
Students will:
0717.4.1 Identify structures and functions of major body systems.
0717.4.2 Explain the integration between body systems.
0717.4.3 Define, pronounce, and spell commonly used terms and abbreviations.
0717.4.4 Compare the relationship of wellness to healthy structures and functions of body systems.
0717.4.5 Identify health risk factors and how these influence disease process.
0717.4.6 Describe common disorders in body systems and their diagnosis and treatment.

Standard 5: Disease Transmission and Prevention (0717.S.5)
Students will demonstrate knowledge of principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:
0717.5.1 Match terms related to infection control with their definitions.
0717.5.2 Describe the function of the immune system, including the appropriate tissues and organs.
0717.5.3 Recognize clinical situations that involve potential growth of microorganisms.
0717.5.4 Identify common nosocomial infections.
0717.5.5 Identify common pathogenic microorganisms.
0717.5.6 Apply the knowledge of the chain of infection to clinical practice.
0717.5.7 Apply proper hand washing technique to clinical situations.
0717.5.8 Compare the effectiveness of methods used to destroy bacteria.
0717.5.9 Select appropriate personal protective equipment and clothing for specific tasks.
0717.5.10 Don and remove Personal Protective Equipment (PPE).
0717.5.11 Summarize and differentiate the isolation categories established by the Centers for Disease Control (CDC).
0717.5.12 Describe methods of handling biohazard equipment, supplies, specimens and waste.
0717.5.13 Apply OSHA standards as established for clinical situations.
0717.5.14 Describe the components of an exposure incident.
0717.5.15 Complete an incident report.
0717.5.16 Recognize symbols for biohazards and standard precautions.

Standard 6: Sterile Technique (0717.S.6)

Students will apply principles of sterile technique.

Sterile Techniques Objectives
Students will:
0717.6.1 Compare and contrast methods of sterilization.
0717.6.2 Practice and maintain a clean and healthy environment.
0717.6.3 Compare and contrast medical asepsis and surgical asepsis.
0717.6.4 Demonstrate prescribed techniques as related to sterility.
0717.6.5 Assess and initiate proper storage methods and monitor expiration periods for sterilized equipment.
0717.6.6 Assist with sterile procedures, including but not limited to setting up a sterile field, donning sterile gloves, and transfer techniques.

Standard 7: Specialty Area Procedure (0717.S.7)
Students will implement procedures within the scope of specialty area.

Specialty Area Procedures Objectives
Students will:
0717.7.1 Utilize appropriate supplies and equipment.
0717.7.2 Maintain and calibrate equipment.
0717.7.3 Explain specialty/specific procedures and provide related information.
0717.7.4 Perform procedures according to industry standards and manufacturers directions.
0717.7.5 Perform procedures in a logical and sequential manner.
0717.7.6 Customize, adjust or modify procedures as needed and within established guidelines.
0717.7.7 Document procedures accurately.
0717.7.8 Recognize and report abnormal findings.

Standard 8: Technology (0717.S.8)
Students will access and use electronically produced information to master course standards.

Technology Objectives
Students will:
0717.8.1 Describe computer applications currently being used in today's health care setting.
0717.8.2 Use software and hardware to practice and master concepts identified in the course.
0717.8.3 Use the internet as a resource/research tool.

Standard 9: CPR (0717.S.9)
Students will demonstrate knowledge and skill in performing health care provider/professional level Cardiopulmonary Resuscitation.

CPR Objectives
Students will:
0717.9.1 Analyze the differences in the performance of CPR as it pertains to the health professional.
0717.9.2 Secure certification in CPR for the Professional Rescuer from American Red Cross or Health Care Provider (HCP) from American Heart Association.

Standard 10: Student Organizations (0717.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0717.10.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0717.10.2 Apply parliamentary procedure in organizational meetings.
0717.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0717.10.4 Take part in local, state, and national health care and education projects.

Diversified Clinical Applications*

Students will be provided with entry-level knowledge and skills needed to function in a variety of health care settings. Students are required to choose a specialized occupational area for in-depth classroom study and must complete a minimum of 55-100 hours in a correlated (work-based) clinical experience as part of the course. Specialized courses with more in-depth instructional standards and objectives have been established for specific occupations. These appear in the *Program Guide for Health Occupations Education in West Virginia*. All standards and objectives must be mastered before students attain established credentials and/or industry validation. Students are encouraged to participate in a Career and Technical Student Organization (CTSO). *For students who are preparing for entry level employment in a health occupation.

Standard 1: Employment (0719.S.1)
Students will be prepared for entry-level employment in a health occupation.

Employment Objectives
Students will:
0719.1.1 Achieve course objectives for classroom study in a specialized occupational area.
0719.1.2 Achieve objectives for clinical internships established for occupational specializations, i.e., dental assisting.
0719.1.3 Meet entry-level requirements for certification or registration in a health occupation.

Standard 2: Technology (0719.S.2)
Students will access and use electronically produced information and computers within the health care system.

Technology Objectives
Students will:
0719.2.1 Utilize a computer to input, store and retrieve information.
0719.2.2 Utilize software, hardware, and the Internet to practice and master course standards.

Standard 3: Clinical Internship (0719.S.3)
Students will participate in a clinical internship.

Clinical Internship Objectives
Students will:
0719.3.1 Demonstrate a working knowledge of externship eligibility requirements.
0719.3.2 Comply with required health regulations such as proof of physical examination and immunization status.
0719.3.3 Provide proof of personal health insurance.
0719.3.4 Wear proper clinical attire.
0719.3.5 Maintain academic standards in classroom theory and lab.
0719.3.6 Report to clinical site on time and ready to work.
0719.3.7 Notify clinical site and instructor when absent.
0719.3.8 Conform to policies regarding performance of skills and scope of responsibility.
0719.3.9 Correctly and safely perform entry-level procedures under supervision of an instructor or clinical site preceptor.
0719.3.10 Request assistance or clarification as needed.
0719.3.11 Maintain professional standards including client confidentiality.
0719.3.12 Organize and effectively manage time.
0719.3.13 Complete documentation required of clinical internship accurately.
0719.3.14 Participate in clinical internship evaluation process.
0719.3.15 Utilize facility resources, i.e., other staff members, manuals, and training updates.

Standard 4: Job Seeking and Keeping (0719.S.4)
Students will identify strategies for job seeking and job keeping.

Job Seeking and Keeping Objectives
Students will:
0719.4.1 Identify the steps involved in job analysis and research.
0719.4.2 Analyze various career options and the preparation required for them.
0719.4.3 Complete a job application, cover letter and resume.
0719.4.4 Demonstrate skills related to the interviewing process.
0719.4.5 Exhibit personal skills such as attendance, time management, and individual responsibility.
0719.4.6 Maintain professional conduct and appearance.
0719.4.7 Utilize analytical skills to solve problems and make decisions.
0719.4.8 Recognize attitudes and behaviors necessary for establishing successful working relationships.
0719.4.9 Judge alternatives for dealing with harassment, bias, and discrimination based on race, color, national origin, sex, religion, gender, handicap, or age.
0719.4.10 Recognize and adhere to the chain of command/lines of authority in the work setting.
0719.4.11 Exhibit characteristics necessary for advancement.
0719.4.12 Recognize the importance of participating in continuing education programs.
0719.4.13 Manage conflict within the workplace through consideration of other's points of view.
0719.4.14 Prepare a letter of resignation.
0719.4.15 Practice team membership skills such as leadership and cooperation.
0719.4.16 Identify the importance of and develop good customer relation skills.

Standard 5: Student Organizations (0719.S.5)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organization Objectives
Students will:
0719.5.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0719.5.2 Apply parliamentary procedure in organizational meetings.
0719.5.3 Demonstrate team membership skills, such as cooperation and leadership.
0719.5.4 Take part in local, state, and national health care and education projects.

Medical Terminology

Through the study of medical terminology the student will be introduced to the language of medicine. Students will gain an understanding of basic elements, rules of building and analyzing medical words, and medical terms associated with the body as a whole. Utilizing a systems approach, the student will define, interpret, and pronounce medical terms relating to structure and function, pathology, diagnosis, clinical procedures, oncology, and pharmacology. In addition to medical terms, common abbreviations applicable to each system will be interpreted.

Standard 1: Basic Elements of Medical Words (0721.S.1)
Students will effectively use basic medical elements.

Basic Elements of Medical Words Objectives
Students will:

0721.1.1 Identify the four elements that are used to form medical words.
0721.1.2 Analyze medical words by identifying their component elements.
0721.1.3 Describe the basic rules for building medical words.
0721.1.4 Explain the basic steps to defining medical words.
0721.1.5 Analyze the position and role of the suffix when used in a medical term.
0721.1.6 Identify and pronounce surgical, diagnostic, and symptomatic suffixes.
0721.1.7 Analyze suffixes to determine their part of speech.
0721.1.8 Define a diminutive suffix.
0721.1.9 Analyze the position and role of the prefix when used in building medical terms.
0721.1.10 Identify and pronounce prefixes including those indicating position, number, measurement, negation, and direction.

Standard 2: Medical Terminology Associated With the Body As A Whole (0721.S.2)
Students will demonstrate use of medical terminology associated with the body as a whole.

Medical Terminology Associated With the Body As A Whole Objectives
Students will:

0721.2.1 Identify the medical terms associated with the levels of organization of structure and function within the human body.
0721.2.2 Demonstrate an understanding of the disease process by defining medical terms used in pathology.
0721.2.3 Define and pronounce the medical terms used in the anatomical planes of the body, body cavities, and diagnostic imaging.
0721.2.4 Analyze medical terms indicating directional position.
0721.2.5 Interpret the meaning of abbreviations used to indicate body systems, direction, and diagnostic imaging.

Standard 3: Medical Terminology Associated with Body Systems (0721.S.3)
Students will effectively use medical terminology associated with body systems.

- Integumentary
- Gastrointestinal
- Respiratory
- Cardiovascular
- Blood and Lymphatic
- Musculoskeletal
- Genitourinary
- Reproductive
- Endocrine
- Nervous
- Special Senses

Medical Terminology Associated with Body Systems Objectives
The student will:

0721.3.1 Define and pronounce medical terms used to identify the basic structure and function.
0721.3.2 Interpret the meaning of combining forms, suffixes, and prefixes.

0721.3.3	Define and discuss medical terms associated with basic pathology.
0721.3.4	Interpret commonly used diagnostic and symptomatic medical terms.
0721.3.5	Identify and define medical terms used as related to surgical, diagnostic imaging, and laboratory procedures.
0721.3.6	Define medical terms associated with clinical procedures used in the process of examination and evaluation of structure and function.
0721.3.7	Analyze medical terms related to oncology.
0721.3.8	Describe medical terms used in pharmacology to treat common disorders.
0721.3.9	Interpret the meaning of common abbreviations.

Medical Assistant I

This course contains the beginning concepts and skills the student will need for entry level employment as a Medical Assistant for both clinical and administrative duties. Major instructional concepts include: orientation to the career of Medical Assistant, ethics and liability, medical terminology, communication, safety, disease transmission and prevention, anatomy and physiology and clinical procedures. The instructional program content is based upon state guidelines and an occupational analysis of the medical assistant field. Adjustments are made to coincide with local physicians offices and clinics as determined by the instructor, administrator and advisory committee. Students are encouraged to participate in a Career and Technical Students Organization (CTSO).

Standard 1: Role, Function and Career Preparation (0731.S.1)
Students will identify concerning the role, function and career preparation for the medical assistant.

Role, Function and Career Preparation Objectives
Students will:
0731.1.1 Analyze the role and responsibilities of a medical assistant.
0731.1.2 Identify, evaluate and apply ideal attributes of a medical assistant.
0731.1.3 Research medical assistant career opportunities.
0731.1.4 Identify student and professional organizations applicable to the medical assistant.
0731.1.5 Demonstrate job seeking and job keeping skills.
0731.1.6 Explain accreditation, certification and continuing education as they pertain to the professional medical assistant.

Standard 2: Ethics And Liability (0731.S.2)
Students will demonstrate knowledge of medical ethics and liability.

Ethics And Liability Objectives
Students will:
0731.2.1 Explain the Code of Ethics for Medical Assistants and the Medical Assistant Creed.
0731.2.2 Describe the Patient's Bill of Rights.
0731.2.3 Define and describe Advanced Directives.
0731.2.4 Define and apply Privileged Communication as it pertains to the medical office.
0731.2.5 Summarize the difference between ethics and law.
0731.2.6 Compare and contrast Implied Consent and Expressed Consent and their application.
0731.2.7 Demonstrate the rules governing Medical Charting.
0731.2.8 Illustrate instances of legal required disclosure.
0731.2.9 Identify Civil and Criminal Law as if pertains to the medical office setting.

Standard 3: Medical Terminology (0731.S.3)
Students will demonstrate knowledge of basic medical terminology.

Medical Terminology Objectives
Students will:
0731.3.1 Interpret commonly used medical roots, prefixes and suffixes.
0731.3.2 Interpret commonly used abbreviations.
0731.3.3 Incorporate standard medical terms and abbreviations in written and oral communications.

Standard 4: Communication (0731.S.4)
Students will learn to communicate effectively with clients and personnel in the medical office.

Communication Objectives
Students will:
0731.4.1 The principles of verbal and non-verbal communication.
0731.4.2 Give and explain proper patient instruction as it relates to basic health care, common medical procedures, and applicable community resources.
0731.4.3 Interpret telephone messages and select appropriate course of action.

Standard 5: Safety (0731.S.5)
Students will describe contributions of the medial assistant to the medical office environment as it pertains to safety issues.

Safety Objectives
Students will:
0731.5.1 Discuss and summarize the OSHA and CDC regulations that apply to the medical office.
0731.5.2 Identify potential office hazards and explain corrective measures.
0731.5.3 Assess common medical emergencies and determine the sequence of appropriate actions, including CPR and the Heimlich maneuver.

Standard 6: Disease Transmission And Prevention (0731.S.6)
Students will demonstrate principles of disease transmission and prevention.

Disease Transmission And Prevention Objectives
Students will:
0731.6.1 Analyze the conditions necessary for the growth and transmission of microbial organisms and ways to prevent the spread of infection.
0731.6.2 Apply CDC guidelines and OSHA standards as established for clinical situations.

Standard 7: Body Structure And Function (0731.S.7)
Students will demonstrate knowledge of basic structure and function for each system of the human body.

Body Structure And Function Objectives
Students will:
0731.7.1 Identify and describe the major structures of each body system.
0731.7.2 Identify and analyze the major functions of each body system.
0731.7.3. Explain the integration between body systems.
0731.7.4 Define, pronounce and spell terms and abbreviations commonly used.
0731.7.5 Describe common disorders in body systems and their diagnosis and treatment.

Standard 8: Physical Examination (0731.S.8)
Students will apply knowledge of basic physical examination skills.

Physical Examination Objectives
Students will:
0731.8.1 Perform screening procedures including the measurement and recording of vital signs, height and weight, vision and hearing screening, and chief complaint.
0731.8.2 Perform assisting skills including positioning and draping, eye and ear procedures, and assisting with special examinations.

Standard 9: Medical and Surgical Asepsis (0731.S.9)
Students will demonstrate knowledge of medical and surgical asepsis.

Medical and Surgical Asepsis Objectives
Students will:
0731.9.1 Differentiate between sanitization, disinfection and sterilization practices and their application in the medical office setting.
0731.9.2 Define and apply techniques of surgical aseptic practices including sterile technique, assisting with minor surgery, and wound care.

Standard 10: Laboratory Procedures (0731.S.10)
Students will demonstrate knowledge of basic laboratory procedures.

Laboratory Procedures Objectives
Students will:
0731.10.1 Explain and discuss the laboratory practices that yield quality assurance and quality control.
0731.10.2 Identify and illustrate the purpose of laboratory tests commonly performed in a medical office, distinguishing between normal and abnormal results.
0731.10.3 Understand and practice accepted standards for specimen collection methods.
0731.10.4 Understand and practice accepted standards for specimen processing methods.
0731.10.5 Record and report laboratory procedures.
0731.10.6 Perform a 12-lead electrocardiogram.

Standard 11: Technology (0731.S.11)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0731.11.1 Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0731.11.2 Utilize the internet as a resource/research tool.

Standard 12: Student Organizations (0731.S.12)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0731.12.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (Skills USA/VICA).
0731.12.2 Apply parliamentary procedure in organizational meetings.
0731.12.3 Demonstrate team membership skills, such as cooperation and leadership.
0731.12.4 Take part in local, state, and national health care and education projects.

Medical Assistant II

The student will receive the skills needed for entry-level employment as a Medical Assistant for both clinical and administrative duties. Major instructional concepts include: administrative procedures, insurance, coding and billing, principles of pharmacology and medication administration. Correlated clinical experience is an integral component of this course. Students must complete a clinical internship with a minimum of 100 hours. The instructional program content is based upon state guidelines and an occupational analysis of the medical assistant field. Adjustments are made to coincide with local physicians offices and clinics as determined by the instructor, administrator and advisory committee. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Administrative Medical Assistant Duties (0732.S.1)
Students will perform office procedures related to administrative medical assistant duties.

Medical Assistant Duties Objectives
Students will:
0732.1.1 Adapt techniques for patient reception, telephone procedures and appointment scheduling.
0732.1.2 Maintain patient records and files.
0732.1.3 Demonstrate basic banking procedures.
0732.1.4 Demonstrate basic accounting skills.
0732.1.5 Operate basic office equipment.

Standard 2: Insurance, Coding, Billing (0732.S.2)
Students will demonstrate an understanding of medical insurance practices, including coding and billing.

Insurance, Coding, Billing Objectives
Students will:
0732.2.1 Discuss and analyze insurance terms and the purpose of coding.
0732.2.2 Complete a basic insurance form.
0732.2.3 Describe computer databases and their usefulness to the medical office.
0732.2.4 Describe computerized office practices for the medical office.

Standard 3: Pharmacology (0732.S.3)
Students will identify principles of pharmacology.

Pharmacology Objectives
Students will:
0732.3.1 Discuss and summarize the legal role and responsibilities of the medical assistant as it pertains to the administration of medications.
0732.3.2 Describe and examine general principles of pharmacology, classification and schedules of drugs.
0732.3.3 Identify and describe the methods of inventory, storage, dispensation, and disposal of drugs.
0732.3.4 Identify and discuss the written information on a prescription or physician's order including the abbreviations and symbols.

Standard 4: Medication Administration (0732.S.4)
Students will identify principles in the administration of medications

Medication Administration Objectives
Students will:
0732.4.1 Distinguish between the systems of measurements.
0732.4.2 Describe and practice safety measures related to the administration of medications.

0732.4.3 Identify and classify preferred routes of administration and sites of administration.
0732.4.4 Select the proper syringe and needle for the administration of parenteral medications.
0732.4.5 Administer medications by various routes.

Standard 5: Clinical Internship (0732.S.5)
Students will participate in a clinical internship with a minimum of 100 hours.

Clinical Internship Objectives
Students will:
0732.5.1 Demonstrate a working knowledge of internship eligibility requirements.
0732.5.2 Comply with required health regulations such as proof of physical examination and immunization status.
0732.5.3 Provide proof of personal health insurance.
0732.5.4 Wear proper clinical attire.
0732.5.5 Maintain academic standards in classroom theory and lab.
0732.5.6 Report to clinical site on time and ready to work.
0732.5.7 Notify clinical site and instructor when absent.
0732.5.8 Conform to policies regarding performance of skills and scope of responsibility.
0732.5.9 Correctly and safely perform entry-level procedures under the supervision of an instructor or clinical site preceptor.
0732.5.10 Request assistance or clarification as needed.
0732.5.11 Maintain professional standards including client confidentiality.
0732.5.12 Organize and effectively manage time.
0732.5.13 Complete documentation required of clinical internship accurately.
0732.5.14 Participate in the clinical internship evaluation process.
0732.5.15 Utilize facility resources i.e., other staff members, manuals, and training updates.

Standard 6: Technology (0732.S.6)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0732.6.1 Integrate the use of software, hardware, and the Internet to practice and master standards identified in the course.
0732.6.2 Utilize the Internet as a resource/research tool.

Standard 7: Student Organizations (0732.S.7)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0732.7.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (Skills USA/VICA).
0732.7.2 Apply parliamentary procedure in organizational meetings.
0732.7.3 Demonstrate team membership skills, such as cooperation and leadership.
0732.7.4 Take part in local, state, and national health care and education projects.

Lodging Management I

Course Description: The Lodging Management Program (LMP) is a two-year lodging curriculum developed by the Educational Institute of the American Hotel and Lodging Association with input from thousands of lodging professionals across the nation. The courses integrate academic and hands-on activities to provide an overview of the industry and competencies necessary for success in various areas of the lodging industry. Completers of the Lodging Management Program are eligible for a national certificate from the American Hotel and Lodging Association. Students must pass rigorous tests at the end of each course and complete a 400 hour, off-campus, paid internship.

Standard 1: Describe the organization and structure of lodging property management. (1201.S.1)

Lodging Property Management Objectives
Students will:
1201.1.1 Identify types of lodging properties.
1201.1.2 Define and discuss each type of lodging property.
1201.1.3 Group lodging properties based on their purpose, location and guests served.
1201.1.4 Identify the classes of lodging properties.
1201.1.5 Identify the differences in levels of service provided by each class of lodging property.
1201.1.6 Explain lodging property ownership and affiliation differences.
1201.1.7 Create an organization chart for a lodging property.
1201.1.8 Classify functional areas of a lodging property by revenue or support centers.
1201.1.9 Diagram the functional areas of the front-of-the-house and the back-of-the-house at a lodging property.
1201.1.10 Create a chart that lists hotel divisions and departments.
1201.1.11 Explain the functions of each division and department at a lodging property.

Standard 2: Explore the elements and strategies of guest service. (1201.S.2)

Guest Service Objectives
Students will:
1201.2.1 Identify the elements of good guest service.
1201.2.2 Distinguish between marketing tangible products and intangible products to guests.
1201.2.3 Describe the involvement of customers in service.
1201.2.4 Describe the concerns of maintaining quality control in relation to guest services.
1201.2.5 Distinguish between controlling inventory and controlling guest demand.
1201.2.6 Analyze time distribution channels in service.
1201.2.7 Explain the role of strategic planning in guest service.
1201.1.8 Create a flow chart showing the steps needed in a strategic plan for guest services.
1201.1.9 Define moments of truth in guest services.
1201.1.10 Set guest services standards for a lodging property.

Standard 3: Prepare for positions in the hospitality industry. (1201.S.3)

Hospitality Industry Objectives:
Students will:
1201.3.1 Chart entry, skilled and managerial level positions in the lodging industry.
1201.3.2 List the career opportunities available for the lodging and food service industry.
1201.3.3 List and discuss career opportunities available with clubs, airlines, cruise lines and travel agencies.
1201.3.4 Create a career ladder for the lodging industry.
1201.3.5 Complete an application and write a letter of application.
1201.3.6 Write a resume.

1201.3.7 Participate in the interview process through mock interviews.
1201.3.8 Compile a career portfolio.

Standard 4: Identify tasks and demonstrate procedures performed by front office employees. (1201.S.4)

Front Office Employees Objectives
Students will:
1201.4.1 Outline the stages in the guest cycle.
1201.4.2 Categorize the events that occur during the guest's pre-arrival, arrival, occupancy and departure stages.
1201.4.3 Examine the importance of protecting a guest's right to privacy.
1201.4.4 Use a logbook to record front office activities.
1201.4.5 Explain the importance of good communication skills in front office positions.
1201.4.6 Create an information directory.
1201.4.7 Create a split folio and master folio.
1201.4.8 List types of equipment and supplies loaned to guests and identify property policies for those items.
1201.4.9 Demonstrate proper handling of guest mail and packages.
1201.4.10 Identify special needs guests and explain roles and responsibilities of the staff.
1201.4.11 Categorize the types of guest complaints and create a priority list.
1201.4.12 Identify and create policies on how to handle guest complaints.
1201.4.13 Develop a follow-up checklist for guest complaints.
1201.4.14 Evaluate the role of front office employees in security.
1201.4.15 Define and explain types of keys used and key control measures taken to protect guests.
1201.4.16 Outline locking systems and their role in protecting guests.
1201.4.17 Create a plan for front desk surveillance, access control, protecting hotel funds and limiting liability of safe deposit boxes.
1201.4.18 Describe lost and found procedures and timelines.
1201.4.19 Develop emergency response procedures and assign staff responsibilities.

Standard 5: Analyze the role of telecommunications in the front office. (1201.S.5)

Telecommunications Objectives
Students will:
1201.5.1 Explain direct-dial calling, operated assisted calls and premium price calls of the guest.
1201.5.2 Outline the functions of a PBX system.
1201.5.3 Demonstrate how a HOBIC works.
1201.5.4 Define a call accounting system.
1201.5.5 List types of phones and map their locations at a lodging property.
1201.5.6 Take and deliver faxes and messages to the guest.
1201.5.7 Demonstrate wake up call procedures and voice mail instructions.
1201.5.8 Demonstrate email and TDD technology offered to the guest.

Standard 6: Learn the functions required for making a guest reservation. (1201.S.6)

Guest Reservation Objectives
Students will:
1201.6.1 Define various types of reservations.
1201.6.2 List the factors of a binding agreement between the lodging property and a potential guest.
1201.6.3 Describe a global distribution system.
1201.6.4 Define an intersell agency.
1201.6.5 List the ways properties directly receive reservations.
1201.6.6 Make a reservation through the internet.

1201.6.7 Contrast affiliate and non-affiliate reservation networks.
1201.6.8 Outline the functions of a central reservations office.
1201.6.9 Access and perform tasks necessary for operating a reservation computer system.
1201.6.10 Identify information needed for forecasting occupancy rates.
1201.6.11 Calculate percentages of no-shows, walk-ins, overstays and understays.
1201.6.12 Create a three-day and ten-day forecast.

Standard 7: Describe the processes involved in the guest registration cycle. (1201.S.7)

Guest Registration Cycle Objectives
Students will:
1201.7.1 Identify the functions and purposes of pre-registration.
1201.7.2 Demonstrate the use of guest registration cards.
1201.7.3 Describe and chart the flow of registration information throughout the lodging property.
1201.7.4 Determine when a room is available for sale and how to communicate room status reports.
1201.7.5 List and interpret rate schedules and special room rates.
1201.7.6 Demonstrate upselling techniques.
1201.7.7 Describe procedures used when turning guests away and referring guest to another property.
1201.7.8 Outline complete registration procedures.
1201.7.9 Discuss various forms of payment accepted.
1201.7.10 Explain property policies on issuing room keys.
1201.7.11 Instruct guests about promotional or special incentive programs available to them.
1201.7.12 Identify features of the guest accounting module of the computer system.
1201.7.13 Create individual, master, non-guest, employee, control, semi-permanent and permanent folios.
1201.7.14 Discuss various types of entries that can be made to guest accounts.

Standard 8: Learn to perform guest checkout and settlement procedures. (1201.S.8)

Guest Checkout and Settlement Procedures Objectives
Students will:
1201.8.1 Resolve outstanding account balances using various forms of payment.
1201.8.2 Update room status.
1201.8.3 Create a guest history.
1201.8.4 List departure procedures and three methods of check out options.
1201.8.5 List the steps involved in internal control.
1201.8.6 Complete a front office cash sheet and explain the procedures used for cash banks.
1201.8.7 Explain the purpose of a financial records audit.
1201.8.8 Complete a daily operations report.
1201.8.9 Calculate occupancy ratios and opening ratios.
1201.8.10 Interpret room revenue and room division budget reports.

Standard 9: Demonstrate night audit procedures. (1201.S.9)

Night Audit Objectives
Students will:
1201.9.1 Identify and describe the functions of a night auditor.
1201.9.2 Use the basic account posting formula to complete outstanding postings.
1201.9.3 Reconcile room status discrepancies and balance departmental revenue.
1201.9.4 Verify room rates and no-show reservations.
1201.9.5 Post room rates and taxes.
1201.9.6 Prepare a cash deposit.
1201.9.7 Distribute reports after backing up the system.

Standard 10: Explain the functions of the housekeeping department. (1201.S.10)

Housekeeping Objectives
Students will:
1201.10.1 Identify and create a checklist for the cleaning responsibilities of the housekeeping department.
1201.10.2 Create an inventory list of work performance standards and a frequency schedule.
1201.10.3 Identify steps necessary in staffing and scheduling for the housekeeping department.

Standard 11: Explain the role of inventory control in housekeeping department. (1201.S.11)

Inventory Control Objectives
Students will:
1201.11.1 Identify how recycled and non-recycled inventories are maintained.
1201.11.2 Calculate expected inventories and establish inventory levels.
1201.11.3 Identify types of linens and calculate necessary par levels for each type.
1201.11.4 Take a physical inventory of linens and describe effective inventory control methods.
1201.11.5 Describe purchasing responsibilities of the executive housekeeper.
1201.11.6 Identify factors to be considered in an annual linen purchase.

Standard 12: Demonstrate correct guest room cleaning procedures. (1201.S.12)

Cleaning Procedures Objectives
Students will:
1201.12.1 Assemble guest room cleaning supplies on a housekeeping cart.
1201.12.2 Complete a guest room assignment sheet and a room status report.
1201.12.3 Enter a guest room properly.
1201.12.4 Perform basic cleaning tasks in a safe and efficient manor and conduct an inspection.
1201.12.5 Identify new technology that has effected guest room cleaning.

Standard 13: Demonstrate knowledge of on-premise laundry management practices. (1201.S.13)

Laundry Management Practices Objectives
Students will:
1201.13.1 Explain the characteristics of various fabric types.
1201.13.2 List the steps in the laundry cycle.
1201.13.3 Oversee the collection and transportation of soiled linens.
1201.13.4 Demonstrate the proper procedures for sorting, loading, extracting and washing of different linen types.
1201.13.5 Demonstrate the proper procedures for drying, ironing, folding and storing linens.
1201.13.6 Identify types of commercial laundry equipment.
1201.13.7 Outline the importance of a safe, preventive maintenance program.

Standard 14: Discuss carpet construction and maintenance procedures. (1201.S.14)

Carpet Construction and Maintenance Procedures Objectives
Students will:
1201.14.1 Identify carpet types and durability factors.
1201.14.2 Identify primary and secondary backings used on carpets.
1201.14.3 Identify preventative measures and solutions for carpet wicking, shedding, pilling and mildew.

1201.14.4 Demonstrate how to use a floor plan and calendars to schedule routine and preventive carpet maintenance.
1201.14.5 Identify the types and functions of carpet care equipment.

1201.14.6 Demonstrate vacuuming procedures and dry powder cleaning methods.

1201.14.7 Identify applications for antimicrobial cleaning methods, electrostatic dissipation treatments and extraction techniques.

Standard 15: Address safety, chemical and security management in detail. (1201.S.15)

Safety, Chemical and Security Management Objectives
Students will:
1201.15.1 Identify potentially hazardous conditions present at a lodging property.
1201.15.2 Demonstrate safe use of ladders and electrical equipment.
1201.15.3 Store, handle and label chemicals properly.
1201.15.4 Analyze the safety of housekeeping jobs.
1201.15.5 Describe the concerns of using water to clean.
1201.15.6 Explain how to use bathroom cleaners safely.
1201.15.7 Identify common all-purpose cleaners and their additives.
1201.15.8 Compile the safety equipment needed when handling chemicals.
1201.15.9 List the five steps needed to comply with the HazComm standard.
1201.15.10 Create a hazardous chemicals list for the housekeeping department.
1201.15.11 Obtain Material Safety Data Sheets (MSDS) from chemical suppliers.
1201.15.12 List and explain possible housekeeping security risks.
1201.15.13 Define types of fires and create a safety training procedures plan.

Lodging Management II

The Lodging Management Program (LMP) is a two-year lodging curriculum developed by the Educational Institute of the American Hotel and Lodging Association with input from thousands of lodging professionals across the nation. The courses integrate academic and hands-on activities to provide an overview of the industry and competencies necessary for success in various areas of the lodging industry. Completers of the Lodging Management Program are eligible for a national certificate from the American Hotel and Lodging Association. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship.

Standard 1: Define various management styles and their functions. (1202. S.1)

Management Styles Objectives
Students will:

1202.1.1 List the challenges managers face in balancing the focus of management with the vision of leadership.
1202.1.2 Define empowerment.
1202.1.3 Distinguish between centralized and decentralized organizations.
1202.1.4 Illustrate why a manager's authority must equal the manager's responsibility.
1202.1.5 Define quality service, a guest's perceived value and moments of truth.
1202.1.6 Describe a manager's role and responsibility in quality guest service.
1202.1.7 Define diversity and the role that it plays for a hospitality manager.
1202.1.8 Summarize the Americans with Disabilities Act.
1202.1.9 Respond to potential sexual harassment issues.

Standard 2: Explain the role and necessity of excellent communication skills in the lodging industry. (1202.S.2)

Communication Skills Objectives
Students will:

1202.2.1 List the seven myths about communication.
1202.2.2 Identify ways that managers can improve their communication skills.
1202.2.3 Outline the barriers to effective communication.
1202.2.4 Outline tips for effective speaking and presentations (formal and informal).
1202.2.5 Use visual aids effectively.
1202.2.6 List techniques for active listening.
1202.2.7 Explain the importance of good business writing.
1202.2.8 List basic business writing rules.
1202.2.9 Write a standard business letter and business memorandum.

Standard 3: Possess a thorough knowledge of effective team building techniques. (1202.S.3)

Team Building Objectives
Students will:

1202.3.1 Define a team.
1202.3.2 Explain the stages of team development.
1202.3.3 Describe the roles of individuals as team members.
1202.3.4 Create a team using teambuilding techniques.

Standard 4: Prepare a personal career development plan. (1202.S.4)

Career Development Objectives
Students will:
1202.4.1 Discuss the importance of self-assessment.
1202.4.2 Recognize the reasons for self-marketing and personal promotion.
1202.4.3 Prepare for a first and second interview.
1202.4.4 Respond to job offers.

Standard 5: Discuss hospitality sales and marketing plans. (1202.S.5)

Sales and Marketing Plans Objectives
Students will:
1202.5.1 Explain the difference between marketing and sales.
1202.5.2 Identify the roles and responsibilities of the various positions in the sales and marketing department.
1202.5.3 Explain the four P's of marketing.
1202.5.4 Identify and define lodging market segments.

Standard 6: Will create a marketing plan. (1202.S.6)

Marketing Plan Objectives
Students will:
1202.6.1 Identify the components and list the steps used in developing a marketing plan.
1202.6.2 Perform a marketing audit.
1202.6.3 Explain target markets and positioning.
1202.6.4 Describe marketing objectives, action plans and evaluation procedures.

Standard 7: Explain the functions of a sales office at a lodging property. (1202.S.7)

Sales Office Objectives
Students will:
1202.7.1 List types of meetings and sales records.
1202.7.2 Explain the purpose of a function book and guest room control book.
1202.7.3 Discuss the various filing systems used in a sales office.
1202.7.4 Explain the role of automated systems used to make lists, reports, analyze applications and to provide client information.

Standard 8: Explain the purpose and functions of the banquet and meeting room sales departments. (1202.S.8)

Banquet and Meeting Room Sales Departments Objectives
Students will:
1202.8.1 Outline the basic responsibilities and duties of banquet department employees.
1202.8.2 Explain types of advertising and promotion used in the banquet department.
1202.8.3 Identify the different types of food and beverage sales at a lodging property.
1202.8.4 List types of meeting rooms and meeting room set-ups.
1202.8.5 Book and manage the meeting room functions of a lodging property.

Standard 9: Explain why selling is everyone's responsibility. (1202.S.9)

Selling Objectives
Students will:
1202.9.1 Identify the importance of training and motivating an employee "to sell" the property's

products and services.

1202.9.2 Discuss the importance of relationship selling.

1202.9.3 Describe what is meant by upgrading, suggestive selling and cross selling.

1202.9.4 Illustrate the roles of switchboard operators, reservationists, front desk personnel and food and beverage employees in sales. .

Standard 10: Describe the various telephone sales methods. (1202.S.10)

Telephone Sales Objectives

Students will:

1202.10.1 Explain the basis of effective telephone communication.

1202.10.2 Make sales, promotional, service and public relations calls.

1202.10.3 List and explain the various types of incoming calls.

1202.10.4 Describe a telephone sales blitz.

1202.10.5 Explain the necessary steps in setting up a telemarketing program.

Standard 11: Describe the relationship between hotels and the food service industry. (1202.S.11)

Relationship Between Hotels and Food Service Objectives

Students will:

1202.11.1 List and describe the different types of food service operations and the markets that they serve.

1202.11.2 List the primary departments in a large hotel and define their roles and responsibilities.

1202.11.3 Identify various positions held in the food and beverage department and define their individual roles and responsibilities.

1202.11.4 Explain the critical role of food sanitation practices in food and beverage operations.

Standard 12: Demonstrate the importance of menu knowledge to the food and beverage operations. (1202.S.12)

Food and Beverage Operations Objectives

Students will:

1202.12.1 Describe menu styles and schedules.

1202.12.2 List and explain menu types.

1202.12.3 Explain the importance of menu planning, menu design and menu pricing.

Standard 13: Discuss the structure and scope of dining and beverage service. (1202.S.13)

Dining and Beverage Service Objectives

Students will:

1202.13.1 Identify dining service staff positions.

1202.13.2 Define dining service styles and procedures.

1202.13.3 List the factors that describe superior guest service.

1202.13.4 Identify Beverage Service Procedures.

1202.13.5 Explain the components of responsible beverage service.

Standard 14: Discuss the concepts of casual/theme restaurants. (1202.S.14)

Casual/Theme Restaurants Objectives

Students will:

1202.14.1 Explain what is meant by a marketing perspective.

1202.14.2 Describe how managers set quality standards and deal with training issues.

1202.14.3 List typical dining service staff positions and explain their roles and responsibilities.

1202.14.4 Identify the steps used in the delivery of guest service.

Standard 15: Book and plan banquets and catered events. (1202.S.15)

Banquets and Catered Events Objectives

Students will:

1202.15.1 Identify elements of a contract or letter of agreement and provide an example of each.
1202.15.2 Set up a function room and prepare the staff schedule for the event.
1202.15.3 Prepare, plate, hold and serve food at an event.
1202.15.4 Identify challenges for delivery service at a function.
1202.15.5 Discuss protocol issues.
1202.15.6 Explain payment plan options for banquets and catered events.
1202.15.7 Discuss the importance of customer feedback after delivery of service.

Standard 16: Explain the purpose and functions of room service operations. (1202.S.16)

Room Service Operations Objectives

Students will:

1202.16.1 List the key elements of a well-managed room service operation.
1202.16.2 Evaluate staffing issues and the role of forecasting in staff scheduling.
1202.16.3 Demonstrate how to take, route, prepare, deliver and follow-up room service orders.

Standard 17: Complete a 400-hour, off-campus, paid internship in a lodging property. (1202.S.17)

Paid Internship Objectives

Students will:

1202.17.1 Develop task performance necessary for success in each functional area as described in the LMP workplace competency checklist.
1202.17.2 Develop work habits necessary for success in each functional area as described in the LMP workplace competency checklist.
1202.17.3 Develop the applied knowledge necessary for success in each functional area as described in the LMP workplace competency checklist.

Advertising

This course focuses on the purpose of the promotional strategy of advertising and its role in the marketing environment. Emphasis is placed on the different types of print, broadcast and specialty media, and the advantages and disadvantages of each type. This course will also give an overview of other promotional tools used in the marketing arena.

Standard 1: Fundamentals of Marketing (0401.S.1)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
Students will:
0401.1.1 Define the role of marketing and its importance.
0401.1.2 Explain the functions of marketing.
0401.1.3 State the marketing concept.
0401.1.4 Describe the economic benefits of marketing.
0401.1.5 Identify the 4 P's of the marketing mix.
0401.1.6 Illustrate the use of product positioning.
0401.1.7 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0401.1.8 Construct a customer profile.

Standard 2: Promotion (0401.S.2)
Define Promotion.

Promotion Objectives
Students will:
0401.2.1 Explain the role of promotion.
0401.2.2 Explain the concept of the promotional mix.
0401.2.3 Develop a promotional plan.
0401.2.4 Evaluate ethical standards of various promotional media.
0401.2.5 Distinguish between advertising, publicity, sales promotion and visual merchandising.

Standard 3: Advertising as a Promotional Tool (0401.S.3)
Explore Advertising as a Promotional Tool.

Advertising as a Promotional Tool Objectives
Students will:
0401.3.1 Identify the characteristics and benefits of advertising.
0401.3.2 Explore advertising careers.
0401.3.3 Explore the history of advertising.
0401.3.4 Differentiate between the roles of an advertising agency and an in-house advertising department.
0401.3.5 Describe how the advertising agency industry is regulated.

Standard 4: Advertising Media (0401.S.4)
Analyze Various Types of Advertising Media.

Advertising Media Objectives
Students will:
0401.4.1 Identify the various types of media.

0401.4.2 Analyze the advantages and disadvantages of each type of media.
0401.4.3 Select the appropriate media for the target market.
0401.4.4 Identify standards for selecting advertising media.
0401.4.5 Evaluate the effectiveness of advertising media.

Standard 5: Advertising Budget (0401.S.5)
Describe the Purpose of an Advertising Budget.

Advertising Budget Objectives
Students will:
0401.5.1 Identify methods of advertising budgeting.
0401.5.2 Calculate media costs.
0401.5.3 Develop a budget.
0401.5.4 Develop an advertising schedule.
0401.5.5 Explain the role of advertising as an investment.
0401.5.6 Explain placement costs for print and broadcast advertisements.

Standard 6: Advertisement Development (0401.S.6)
Develop Advertisements.

Advertisement Development Objectives
Students will:
0401.6.1 Identify the parts of a print advertisement.
0401.6.2 Create advertising headlines.
0401.6.3 Write advertising body copy.
0401.6.4 Analyze illustrations.
0401.6.5 Choose appropriate styles of typeface.
0401.6.6 Explain the levels of Maslow's Hierarchy of needs.
0401.6.7 Illustrate the types of eye flow patterns.
0401.6.8 Differentiate between the optical center and focal point.
0401.6.9 Explain the steps of developing print advertisements.
0401.6.10 Develop an advertisement layout.
0401.6.11 Develop a television storyboard.
0401.6.12 Write a radio commercial.
0401.6.13 Explain the psychological use of lines.
0401.6.14 Demonstrate the use of color in advertising.
0401.6.15 Create a slogan, logo and signature.
0401.6.16 Describe how to check advertising proofs.

Standard 7: Visual Merchandising as a Promotional Tool (0401.S.7)
Create a Visual Merchandising Display.

Visual Merchandising Objectives
Students will:
0401.7.1 Identify the characteristics and benefits of visual merchandising.
0401.7.2 Identify window and interior display arrangements.
0401.7.3 Illustrate types of display patterns of arrangements.
0401.7.4 Explain how exterior and interior features contribute to the store's image.
0401.7.5 Identify the artistic considerations in display preparations.
0401.7.6 Select display fixtures.
0401.7.7 Design a display sign.
0401.7.8 Select merchandise for display.

0401.7.9 Create a display.
0401.7.10 Describe the procedures for maintaining and dismantling displays.

Standard 8: Public Relations/Publicity as a Promotional Tool (0401.S.8)
Define Public Relations/Publicity as a Promotional Tool.

Public Relations/Publicity Objectives
Students will:
0401.8.1 Identify the characteristics and benefits of public relations.
0401.8.2 Identify the audiences for public relations.
0401.8.3 Explain the importance of company participation in community activities.
0401.8.4 Write a media release.

Standard 9: Technology (0401.S.9)
Explore the Use of Technology in Promotion.

Technology Objectives
Students will:
0401.9.1 Identify technology-based promotion.
0401.9.2 Utilize software applications in the development of promotional tools.

Standard 10: Sales Promotion as a Promotional Tool (0401.S.10)
Define Sales Promotion as a Promotional Tool.

Sales Promotion Objectives
Students will:
0401.10.1 Identify the characteristics and benefits of sales promotion.
0401.10.2 Differentiate between the various types of sales promotion.
0401.10.3 Analyze the advantages and disadvantages of the various types of sales promotion.
0401.10.4 Select appropriate sales promotion.
0401.10.5 Develop a sales promotion.
0401.10.6 Evaluate the effectiveness of a sales promotion.
0401.10.7 Justify the need for sponsorship.

Economics of Business

This course focuses on the impact of economics as it relates to businesses and individuals. Because businesses are part of the overall economy, the success of any individual business is strongly affected by events in the economy as a whole. In addition, the economy as a whole is affected by the actions of the individual members within it.

Standard 1: Economic Principles (0404.S.1)
Describe the importance of economic principles in today's society.

Economic Principles in Today's Society Objective
Students will:
0404.1.1 Identify opportunity costs and trade-offs involved in making choices about how to use scarce economic resources.
0404.1.2 Give examples of economic wants and needs.
0404.1.3 Identify the resources (factors of production) that are used to satisfy wants and needs.
0404.1.4 Define economic goods and services.
0404.1.5 Explain how the concept of scarcity affects the availability of economic goods and services.

Standard 2: Productivity, Specialization and Division of Labor Change (0404.S.2)
Explain the importance of productivity and discuss how specialization and division of labor change productivity.

Productivity, Specialization and Division of Labor Change Objective
Students will:
0404.2.1 Analyze the methods of increasing productivity.
0404.2.2 Demonstrate specialization and division of labor.
0404.2.3 Explain how the relationship of input to output affects the level of productivity.

Standard 3: Basic Economic Systems Differences (0404.S.3)
Explain why societies develop economic systems and identify the basic features of different economic systems.

Basic Economic Systems Differences Objectives
Students will:
0404.3.1 Explain why a society needs an economic system.
0404.3.2 Discuss advantages and disadvantages of different types of economic systems.
0404.3.3 Discuss how an economic system addresses the questions what is to be produced, how it is to be produced, and for whom.

Standard 4: Role of Core U.S. Economic Institutions and Incentives (0404.S.4)
Explain the role of core economic institutions and incentives in the U.S. economy.

Core U.S. Economic Institutions and Incentives Objective
Students will:
0404.4.1 Describe the concept of profit in the free enterprise system.
0404.4.2 Provide examples of economic institutions and incentives.
0404.4.3 Analyze reasons why a society's allocation of resources will be affected by its laws, public policy, and taxation.

Standard 5: Role of Exchange and Money (0404.S.5)
Explain the role of exchange and money in an economic system and describe the effect of interdependence on economic activity.

Role of Exchange and Money Objective
Students will:
0404.5.1 Demonstrate the concept of barter.
0404.5.2 Explain why and illustrate how money can contribute to an increased number of exchanges, greater specialization and interdependence, and a higher standard of living in an economy.

Standard 6: Role of Supply and Demand as related to Markets and Prices in the U.S (0404.S.6)
Describe the role of law of supply and demand in the U.S. economy.

Role of Markets and Prices in the U.S. Economy Objective
Students will:
0404.6.1 Define the concept of supply and demand.
0404.6.2 Analyze prices as determined by supply and demand.
0404.6.3 Identify determinants of supply and demand for goods and services.
0404.6.4 Describe how relative prices affect buying and selling decisions of producers and consumers.
0404.6.5 Graph the concept of price on a supply and demand curve.

Standard 7: Types of Competitive Structures and Markets (0404.S.7)
Describe different types of competitive structures and illustrate the role of competitive markets in the U.S. and other economies.

Types of Competitive Structures and Markets Objective
Students will:
0404.7.1 Explain how competition among sellers affects prices and profits.
0404.7.2 Determine the role of government in preventing private monopolies and regulating public monopolies.
0404.7.3 Research U.S. laws and government regulations that are designed to maintain competition.
0404.7.4 Compare and contrast price and non-price competition.

Standard 8: Personal Financial Resources and Consumer Decisions (0404.S.8)
Manage limited personal financial resources and recognize that more of the wants and needs of members of a society can be satisfied if wise consumer decisions are made.

Personal Financial Resources and Consumer Decisions Objective
Students will:
0404.8.1 Analyze the consumer decision making process for products and explain why there is variance in price for a given item bought from different suppliers.
0404.8.2 Use published consumer resources to collect information for making buying decisions.
0404.8.3 Identify sources and types of credit.
0404.8.4 Calculate the cost of credit.
0404.8.5 Develop a plan to allocate financial resources to meet an individual's financial goals.
0404.8.6 Describe the advantages and disadvantages of different saving and investing plans.
0404.8.7 Identify services that financial institutions provide to customers.
0404.8.8 Perform the steps involved in opening and using a checking account.
0404.8.9 Reconcile a bank statement.

Standard 9: U.S. Economy Functions and Measures (0404.S.9)
Explain how the U.S. economy functions as a whole and describe economic measures of economic activity such as gross domestic product, unemployment and inflation.

U.S. Economy Functions and Measures of Activities Objective
Students will:
0404.9.1 Explain the Consumer Price Index.
0404.9.2 Analyze the factors that affect Gross Domestic Product.

Standard 10: Role of Government in an Economic System (0404.S.10)
Discuss the role of government in an economic system, especially the necessary and desirable role of government in the U.S. economy.

Role of Government in an Economic System Objectives
Students will:
0404.10.1 Explain how government taxation affects consumers and producers.
0404.10.2 Define and give examples of progressive, regressive, and proportional taxes.
0404.10.3 Analyze the effect of national debt on the level of economic activity.

Standard 11: U.S. Economy Citizens Rights and Responsibilities (0404.S.11)
Describe rights and responsibilities of citizens in the U.S. economy.

U.S. Economy Citizens Rights and Responsibilities Objective
Students will:
0404.11.1 Identify consumer rights.
0404.11.2 Describe how legislation defines and protects consumer rights.
0404.11.3 Examine how society's needs are balanced against the individual's rights and responsibilities.
0404.11.4 Explain how consumer legislation affects product.
0404.11.5 Distinguish between fraudulent, misleading, and legitimate product claims.

Standard 12: Economic Relationships Among Nations (0404.S.12)
Examine the importance of economic relationships among nations and discuss the role of international trade and investment and international monetary relations in the global economy.

Economic Relationships Among Nations Objectives
Students will:
0404.12.1 Explain the importance of imports and exports in a global economy.
0404.12.2 Identify examples of goods and services that imported and exported.
0404.12.3 Explain foreign exchange rates and why the value of currency changes.
0404.12.4 Explain the advantages and disadvantages of free trade agreements between and among nations.

Fashion Marketing

This course is designed for students to gain basic knowledge of the fashion marketing industry and provide the learner with skills for a career in the field of Fashion Marketing.

Standard 1: Nature of Fashion (0407.S.1)
Explore the Nature of Fashion.

Nature of Fashion Objectives
Students will:
0407.1.1 Explain the concept of fashion in terms of apparel, home fashion and accessories.
0407.1.2 Explain the components of fashion.

Standard 2: Fundamentals of Marketing (0407.S.2)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
Students will:
0407.2.1 Define the role of marketing and its importance.
0407.2.2 List examples of marketing functions and related activities.
0407.2.3 Differentiate between the concepts of marketing segmentation, niche and mass marketing.
0407.2.4 Identify the elements of the marketing mix.
0407.2.5 Demonstrate the flow of products in the channel of distribution.
0407.2.6 State the marketing concept.

Standard 3: History and Trends of Fashion (0407.S.3)
Explore the History and Trends of Fashion.

History and Trends of Fashion Objectives
Students will:
0407.3.1 Research and describe the theories of the origin of fashion.
0407.3.2 Describe the influence of historical events on fashion.
0407.3.3 Analyze the influences that economic, culture, social, political, geographic and psychological factors have on fashion.
0407.3.4 Explain the use and importance of fashion cycles.
0407.3.5 Differentiate between fashion trends, fads and classics.
0407.3.6 Identify current trends in fashion.

Standard 4: Color and Design Fundamentals (0407.S.4)
Analyze Color and Design Fundamentals.

Color and Design Fundamentals Objectives
Students will:
0407.4.1 Describe elements and principles of line and design.
0407.4.2 Discuss how to use design to create illusions that enhance appearance.
0407.4.3 Analyze standardized sizing in the fashion industry.
0407.4.4 Explain the principles of color psychology and symbolism and its relationship to fashion.
0407.4.5 Identify purpose of color wheel and analyze color schemes.

Standard 5: Textile Characteristics (0407.S.5)
Evaluate Textile Characteristics.

Textile Characteristics Objectives
Students will:
0407.5.1 Identify the characteristics of natural and man-made fibers.
0407.5.2 Describe the relationship between fabric characteristics and product use.
0407.5.3 Identify the most common fabric constructions.

Standard 6: Economic Principles as Related to the Fashion Industry (0407.S.6)
Describe the Importance of Economic Principles as it relates to the Fashion Industry.

Economic Principles Objectives
Students will:
0407.6.1 Differentiate between goods and services.
0407.6.2 Discuss advantages and disadvantages of the different types of economic systems.
0407.6.3 Explain the concept of profit.
0407.6.4 Discuss the benefits of competition.
0407.6.5 Analyze the law of supply and demand.
0407.6.6 Examine the relationship between cost and price.
0407.6.7 Explain utility.

Standard 7: Communication Skills (0407.S.7)
Enhance Communication Skills.

Communication Skills Objectives
Students will:
0407.7.1 Explain the importance of verbal and nonverbal communication.
0407.7.2 Demonstrate proper telephone communication skills.
0407.7.3 Use effective writing skills.

Standard 8: Customer Service Skills (0407.S.8)
Develop Customer Service Skills.

Customer Service Skills Objectives
Students will:
0407.8.1 Explain the importance of customer service as it relates to a retail business.
0407.8.2 Demonstrate procedures for handling customer complaints.
0407.8.3 Handle multiple tasks simultaneously.
0407.8.4 Interpret company policies to customers.

Standard 9: Principles of Selling (0407.S.9)
Apply the Principles of Selling.

Principles of Selling Objectives
Students will:
0407.9.1 Identify the steps in the selling process.
0407.9.2 Identify and explain the different approaches of opening a sale.
0407.9.3 Conduct a sales presentation for a product or service.
0407.9.4 Choose the proper method of handling objections in order to close a sale.
0407.9.5 Identify and explain the different types of closing a sale.
0407.9.6 Explore various sales careers in the fashion industry.

0407.9.7 Apply textile knowledge to a sales presentation.

Standard 10: Careers in Fashion Marketing (0407.S.10)
Research Careers in Fashion Marketing.

Careers in Fashion Marketing Objectives
Students will:
0407.10.1 Identify personal traits important in a fashion career.
0407.10.2 Identify career opportunities in fashion sales, textiles and manufacturing industries.
0407.10.3 Identify an acceptable fashion image for work, school and social activities.

Standard 11: Technology in the Fashion Industry (0407.S.11)
Explore Technology in the Fashion Industry.

Fashion Industry Technology Objectives
Students will:
0407.11.1 Investigate computer technology applications in fashion marketing.
0407.11.2 Identify computer technology used in fashion/fabric design and production.

Standard 12: Principles of Promotion (0407.S.12)
Demonstrate the Principles of Promotion.

Principles of Promotion Objectives
Students will:
0407.12.1 Identify the elements of the promotional mix in fashion marketing.
0407.12.2 Analyze types of media used in fashion retail advertising.
0407.12.3 Identify the parts of a print advertisement.
0407.12.4 Prepare a broadcast advertisement.
0407.12.5 Analyze visual merchandising displays using the elements of display arrangements, color schemes, display background, mannequins and lighting.

Standard 13: Workplace Skills (0407.S.13)
Develop Job-Seeking, Job-Keeping and Job Learning Skills for the Workplace.

Job-Seeking, Job-Keeping and Job Learning Objectives
Students will:
0407.13.1 Explain the concept of work ethics.
0407.13.2 Explain the importance of positive working relationships and employer expectations.
0407.13.3 Complete the procedures for obtaining employment (resume, cover letter, job application, job search, interview, follow-up letter).

Standard 14: Risk Management (0407.S.14)
Explore Risk Management.

Risk Management Objectives
Students will:
0407.14.1 Identify the impact of internal theft and shoplifting.
0407.14.2 Demonstrate basic safety rules relevant to job safety.
0407.14.3 Describe the first aid measures to be used in case of an emergency or accident.
0407.14.4 Classify type A, B, and C fires and describe their characteristics in order to extinguish them properly.

Standard 15: Inventory Control Procedures (0407.S.15)
Describe Inventory Control Procedures.

Inventory Control Procedure Objectives
Students will:
0407.15.1 Describe the importance of inventory control.
0407.15.2 Describe receiving procedures.
0407.15.3 Explain procedures used to issue items and keep track of inventory.

Standard 16: Fashion Market Centers and Designers (0407.S.16)
Identify Fashion Market Centers and Designers.

Fashion Market Centers and Designers Objectives
Students will:
0407.16.1 Identify domestic fashion market centers.
0407.16.2 Identify international fashion market centers.
0407.16.3 Recognize influential fashion designers.

International Business and Marketing

This course is for students with a career interest in the field of international trade or for students who intend to pursue a business/marketing degree. This course provides students with an understanding of the various careers in international trade, finance and marketing. Fundamental concepts, principles, and theories of marketing in an international setting are considered.

Standard 1: Role of International Business (0410.S.1)
Explain the Role of International Business.

Role of International Business Objectives
Students will:

0410.1.1 Identify examples of international trade in the local and state community.
0410.1.2 Describe the impact of international business activities on the local, regional and national levels.
0410.1.3 Analyze the impact of a domestic company involving itself in international trade opportunities.
0410.1.4 Describe the resources (e.g., ports, trade routes, transportation centers, foreign trade zones and natural, financial, and human resources) of major cities around the world.
0410.1.5 Identify business opportunities in countries in various levels of economic development.

Standard 2: Communication Strategies (0410.S.2)
Apply Communication Strategies in International Business Relations.

Communication Strategies Objectives
Students will:

0410.2.1 Compose effective business communications.
0410.2.2 Analyze international business blunders resulting from ineffective or incorrect communication patterns.
0410.2.3 Identify international cultural differences in food, dress, social behaviors and language.
0410.2.4 Compare business protocol of various countries.
0410.2.5 State examples of non-verbal communication affecting international businesses.

Standard 3: Social, Cultural, Political, Legal, and Economic Factors (0410.S.3)
Describe Factors That Shape and Impact the International Business Environment.

Social, Cultural, Political, Legal and Economic Factors that Impact the International Business Environment Objectives
Students will:

0410.3.1 Identify distinctive social and cultural factors affecting business activities (e.g. time, workday, workweek, schedules, holidays).
0410.3.2 Describe how trade barriers, tariffs, quotas and taxation policies affect choice of location for companies operating internationally.
0410.3.3 Recognize legal differences that exist between and among countries in areas such as consumer protection, product guidelines, labor laws, contract formulation, liability and taxation.
0410.3.4 Define terms such as GDP (GNP), balance of trade, foreign debt and cost of living.
0410.3.5 Analyze the availability of resources and economic potential in various countries.
0410.3.6 Identify the economic systems used to decide what to produce, how it is produced, and for whom it is produced in a country.
0410.3.7 Evaluate the competitive strengths and weaknesses faced by a company involved in international business.

Standard 4: International Finance and Risk Management (0410.S.4)
Explain the Role, Importance, and Concepts of International Finance and Risk Management.

International Finance and Risk Management Objectives
Students will:

0410.4.1 Explain how currency exchange rates affect companies.
0410.4.2 Identify risks associated with international trade.

Standard 5: Operations and Management of Human Resources (0410.S.5)
Address the Operations and Management of Human Resources.

Operations and Management of Human Resources Objectives
Students will:

0410.5.1 Describe the production processes used to create goods and services in different countries.
0410.5.2 Discuss factors that influence the type of merchandise/inventory control systems used by companies operating internationally.
0410.5.3 Identify the factors that influence the application of managerial styles in different countries.
0410.5.4 Describe how compensation and employee benefits differ in various cultures.
0410.5.5 Identify how differences in occupational health and safety standards impact the conduct of business internationally.

Standard 6: Marketing Concepts (0410.S.6)
Apply Marketing Concepts to International Business:

Marketing Concepts Objectives
Students will:

0410.6.1 Describe how a company markets a product/service in other countries.
0410.6.2 Illustrate how social, cultural, technological and geographic factors influence consumer buying behavior in different countries.
0410.6.3 Evaluate market potential for a good or service in a foreign market.
0410.6.4 Describe how the marketing mix elements need to be adapted for international marketing efforts.
0410.6.5 Analyze buying patterns of consumers in a foreign market.
0410.6.6 Explain how the marketing research process, including data collection, differs in an international application.
0410.6.7 Give examples of countries that have absolute and comparative advantage.
0410.6.8 Explain how brands and packages are affected by culture.
0410.6.9 Explain how the business environment affects prices charged in foreign markets.
0410.6.10 Select distribution channels for a company involved in international business.
0410.6.11 Discuss media used in different foreign markets.
0410.6.12 Analyze the influence of social and cultural factors affecting promotions used in foreign markets.

Standard 7: Trade Concepts in the Import/Export Process (0410.S.7)
Relate Balance of Trade Concepts to the Import/Export Process.

Trade Concepts Objectives
Students will:

0410.7.1 Identify goods and services imported to or exported from a country.
0410.7.2 Analyze the import or export potential for a good or service.
0410.7.3 Describe the role that U.S. Customs and the customs agencies of other countries play in international trade activities.
0410.7.4 Define why trade barriers are imposed by governments (such as quotas, tariffs, licensing

requirements, exchange rate controls).

0410.7.5 Describe international trade agreements (e.g., GATT, NAFTA).

Standard 8: Business Ownership and Entrepreneurial Opportunities (0410.S.8)

Identify Forms of Business Ownership and Entrepreneurial Opportunities.

Forms of Business Ownership and Entrepreneurial Opportunities Objectives

Students will:

0410.8.1 Analyze various forms of business ownership (e.g., sole proprietorship, corporation, partnership) for different international business situations.

0410.8.2 Determine social and cultural influences on the form of business ownership used or reuired in different countries.

0410.8.3 Identify potential new international business ventures for locally based companies.

0410.8.4 Distinguish between licensing and franchising for international business activities.

Standard 9: Technology in International Business. (0410.S.9)

Identify Technology Utilized in International Business.

Technology in International Business Objectives

Students will:

0410.9.1 Describe how the use of technology impacts the global market.

0410.9.2 Identify global e-commerce legal issues.

Introduction to Business and Marketing

This course is an introduction course that explores careers in business and marketing, the role of marketing in today's business world and a broad overview of economics.

Standard 1: Careers in Business and Marketing (0413.S.1)
Explore Careers in Business and Marketing.

Careers Objectives
Students will:
0413.1.1 Research and present information regarding careers in business and marketing.
0413.1.2 Explain how economic trends affect employment in business and marketing careers.
0413.1.3 Complete an interest survey to determine potential career options.

Standard 2: Private Enterprise System (0413.S.2)
Define and Explain How the Market Works in a Private Enterprise System.

Private Enterprise Objectives
Students will:
0413.2.1 Explore the benefits businesses provide to the economy.
0413.2.2 Compare and contrast the private enterprise system with other economic systems.
0413.2.3 Distinguish between consumer needs and wants and how they are satisfied.
0413.2.4 Explain how consumers affect the supply and demand for goods and services.
0413.2.5 Explain how prices affect consumers and producers.
0413.2.5 Describe the economic resources used in the production of goods and services.
0413.2.6 Identify and discuss economic measurements.
0413.2.7 Describe the four phases of the business cycle.

Standard 3: Social and Ethical Environment of Business (0413.S.3)
Explore Polices of a Diverse Workforce in Business and Marketing.

Social and Ethical Environment Objectives
Students will:
0413.3.1 Describe reasons for layoffs and downsizing.
0413.3.2 Write a job description.
0413.3.3 Discuss on-the-job policies dealing with diversity, drug use on the job, theft in the workplace and sexual harassment.
0413.3.4 Identify the functions, levels and responsibilities of managers.
0413.3.5 Discuss the pros, cons and implications of unionization.
0413.3.6 Explain what is meant by the social responsibilities of business.

Standard 4: Financial Management (0413.S.4)
Demonstrate the Handling of Business Finances.

Financial Management Objectives
Students will:
0413.4.1 Explain the types and purposes of financial statements.
0413.4.2 Describe the responsibilities of the Federal Reserve System.
0413.4.3 Calculate interest and finance charges.
0413.4.4 Identify the purpose, process and implications of obtaining credit.
0413.4.5 Identify laws that protect the consumer when applying for credit.
0413.4.6 Prepare a personal budget.

0413.4.7 Reconcile a bank statement.
0413.4.7 Obtain information regarding services provided by a financial institution.
0413.4.8 Identify the purpose and types of insurance.

Standard 5: Role of Marketing (0413.S.5)
Define the Role of Marketing in Today's World.

Role of Marketing Objectives
Students will:
0413.5.1 Apply the four elements of the marketing mix to products and services.
0413.5.2 Identify the stages of the product life cycle.
0413.5.3 Determine the appropriate channel of distribution for products.
0413.5.4 Identify the steps of pricing.
0413.5.5 Identify the functions of marketing.

Standard 6: Business Structure
Explore Development and Maintenance of a Business.

Business Structure Objectives
Students will:
0413.6.1 Identify unique characteristics of an entrepreneur.
0413.6.2 Compare and contrast the advantages and disadvantages of the types of business ownerships.
0413.6.3 Discuss the opportunities available to an entrepreneur.
0413.6.4 Identify the parts of a business plan and the components.

Standard 7: Government and Business Relationships (0413.S.7)
Explore the Relationship Between Government and Business.

Relationship Between Government and Business Objectives
Students will:
0413.7.1 Examine regulations that are encountered when starting a small business.
0413.7.2 Distinguish between progressive, proportional and regressive taxes.

Standard 8: International Business (0413.S.8)
Define the Importance of International Business in the Market Place.

International Business Objectives
Students will:
0413.8.1 Discuss the pros and cons of free trade.
0413.8.2 List examples of United States imports and exports.
0413.8.3 Identify specific products that currently are subject to government trade policies.
0413.8.4 Compare and contrast the economic systems.
0413.8.5 Identify benefits and challenges to competition in the international marketplace.

Standard 9: Role of a Consumer (0413.S.9)
Identify the Role of a Consumer in Business and Marketing.

Role of a Consumer Objectives
Students will:
0413.9.1 Describe choices consumers make when buying goods and services.
0413.9.2 Discuss the basic rights and responsibilities of a consumer.
0413.9.3 Research why regulations are implemented and the effects the regulations have on consumer safety.

Management and Entrepreneurship

This course provides a background for the development and operation of a business starting with the role of the entrepreneur in our economy to the development of a business plan and the application of specific marketing skills and concepts within the business environment. This course also explores the planning, organizing and controlling of a business, including organizational and human aspects, with emphasis on various theories of management, the knowledge and understanding necessary for managing people and functions, and decision making.

Standard 1: Careers in Supervision and Management (0416.S.1)
Explore the career of a supervisor/manager.

Supervision and Management Career Objectives
Students will:

0416.1.1 Identify unique characteristics of an entrepreneur.
0416.1.2 Compare and contrast the scientific management, functional, human relations/behavioral school and quantitative approaches of management.
0416.1.3 Identify the characteristics of a successful supervisor/manager.
0416.1.4 Identify and discuss the major demographic and societal trends that will affect supervisors/managers in the future.
0416.1.5 Summarize the difficulties supervisors/managers face in fulfilling managerial roles.

Standard 2: Managerial Functions of Supervision (0416.S.2)
Apply the managerial functions to a supervisor or manager's role.

Managerial Function Objectives
Students will:

0416.2.1 Describe and apply the basic steps of the decision-making process.
0416.2.2 Discuss the functions utilized in management.
0416.2.3 Write a mission statement for a business or department.
0416.2.4 Identify examples of strategic plans, tactical plans and operational plans.
0416.2.5 Explain the concept of a chain of command.

Standard 3: Management Communication Skills (0416.S.3)
Explain the importance of effective communication in the manager's role.

Effective Communication Objectives
Students will:

0416.3.1 Define communication and discuss its implication for effective management in the manager's role.
0416.3.2 Diagram the communication process and explain the importance of each component to the process.
0416.3.3 Identify barriers to communication and suggest methods to overcome those barriers.
0416.3.4 Compare and contrast the formal, informal, horizontal and vertical channels of communication.
0416.3.5 Demonstrate effective communication skills.

Standard 4: Employee Motivation (0416.S.4)
Apply employee motivational factors to the manager's role.

Employee Motivation Objectives
Students will:

0416.4.1 Compare various motivation theories and explain their importance for understanding employee behavior.
0416.4.2 Analyze the application of Theory X and Theory Y in motivating employees.
0416.4.3 Classify motivational factors according to Maslow's hierarchy of needs.
0416.4.4 Define job rotation, job enlargement, and job enrichment and their implications in motivating employees.
0416.4.5 Investigate the significance of Total Quality Management (TQM).
0416.4.6 Explain the concept of authority, responsibility and power as a requirement of any managerial position.
0416.4.7 Define delegation, responsibility and accountability and describe their relationship with one another.

Standard 5: Entrepreneurship (0416.S.5)
Explore the role of an entrepreneur.

Entrepreneur Objectives
Students will:
0416.5.1 Compare and contrast the advantages and disadvantages of the types of ownership.
0416.5.2 Identify entrepreneurial opportunities.
0416.5.3 Analyze the parts of a business plan and components included in each part.
0416.5.4 Write and present a business plan for a small business.

Standard 6: Marketing Plan (0416.S.6)
Write a marketing plan for a small business.

Marketing Plan Objectives
Students will:
0416.6.1 Complete a demographic study to determine a market.
0416.6.2 Determine market potential.
0416.6.3 Identify direct and indirect competition.
0416.6.4 Evaluate competitive strengths and weaknesses.
0416.6.5 Explain the importance of choosing a proper location for a business.
0416.6.6 Describe the different types of goods and services.
0416.6.7 State the marketing concept.
0416.6.8 Utilize market segmentation and target marketing.
0416.6.9 Identify and apply the components of the marketing mix.
0416.6.10 Evaluate the importance of price.
0416.6.11 Describe different pricing strategies.
0416.6.12 Calculate price.
0416.6.13 Describe the steps in the selling process.

Standard 7: Financial Plan (0416.S.7)
Write a financial plan for a small business.

Financial Plan Objectives
Students will:
0416.7.1 Analyze the components of a financial plan.
0416.7.2 Compute capital needs.
0416.7.3 Prepare financial statements (income statement, balance sheet, statement of cash flow).
0416.7.4 Analyze financial statements to ascertain financial health of a business.
0416.7.5 Identify parts of an accounting system.

0416.7.6 Write a personal resume.
0416.7.7 Calculate personal net worth.
0416.7.8 Identify personal/financial assets available to collateralize.
0416.7.9 List potential sources of funds for a business.

Standard 8: Management Plan (0416.S.8)
Write a management plan for a small business.

Management Plan Objectives
Students will:
0416.8.1 Compare and contrast types of business ownership.
0416.8.2 Develop an organizational chart.
0416.8.3 Explain how small businesses recruit effectively.
0416.8.4 Prioritize staffing needs.
0416.8.5 Identify motivational techniques for employees.
0416.8.6 Explain employment laws.
0416.8.7 Monitor results of revenue and explain its impact on inventory, personnel, insurance and promotion.
0416.8.8 Analyze inventory procedures.
0416.8.9 Identify resources available for small business assistance.
0416.8.10 Identify government regulations.
0416.8.11 Research business risks and prevention control.
0416.8.12 List and explain components of a legally enforceable contract.
0416.8.13 Discuss business ethics and social responsibility.

Marketing Principles I

This course includes instructional areas designed to provide an understanding of the fundamental marketing processes and the role of marketing in a free enterprise economy.

Standard 1: Marketing Education and Cooperative Procedures (0422.S.1)
Demonstrate Knowledge of Marketing Education and Cooperative Procedures.

Marketing Education and Cooperative Procedures Objectives
Students will:
0422.1.1 Explain the three components of a marketing education program.
0422.1.2 Participate in a simulated business activity.

Standard 2: Human Relation Skills (0422.S.2)
Demonstrate Effective Human Relations Skills.

Human Relations Objectives
Students will:
0422.2.1 Demonstrate the nature of positive consumer/client relations for personal and business success.
0422.2.2 Exhibit appropriate personal appearance, positive attitude, enthusiasm, initiative and behavior in the classroom and in the workplace.
0422.2.3 Demonstrate self-control while handling difficult customers/clients.
0422.2.4 Develop gender-free attitudes about participation in activities in the workplace.
0422.2.5 Analyze self-understanding and self-esteem in the motivation of employees.
0422.2.6 Demonstrate self-control in the handling of customer complaints.
0422.2.7 Set personal goals for the future.
0422.2.8 Use time management principles in creating a schedule of activities.

Standard 3: Job-Seeking, Keeping and Learning Skills (0422.S.3)
Develop Job-Seeking, Job-Keeping and Job Learning Skills for the Workplace.

Job-Seeking, Keeping and Learning Skill Objectives
Students will:
0422.3.1 Explore various marketing occupations.
0422.3.2 Complete the procedures for obtaining employment (resume, cover letter, job application, job search, interview, follow-up letter).
0422.3.3 Identify examples of non-verbal, verbal and written communications.
0422.3.4 Use proper grammar and vocabulary in verbal and written communication.
0422.3.5 Prepare a portfolio of sample work to be utilized in an interview.
0422.3.6 Prepare for and practice an interview for a potential job.

Standard 4: Basic Marketing Math Skills (0422.S.4)
Perform Basic Marketing Math Skills that are utilized in the workplace.

Basic Marketing Math Skills Objectives
Students will:
0422.4.1 Perform procedures associated with the handling of cash, credit cards, and checks (e.g. making change, preparing and closing cash drawers, correcting register errors).
0422.4.2 Operate a calculator to calculate tax, discounts and net sales.
0422.4.3 Process exchanges, returns, allowances, layaways and other types of sales transactions.

Standard 5: Fundamentals of Marketing (0422.S.5)
Describe the Fundamentals of Marketing.

Marketing Fundamental Objectives
Students will:
0422.5.1 Define the role of marketing and its importance.
0422.5.2 Explain the functions of marketing.
0422.5.3 State the marketing concept.
0422.5.4 Describe the economic benefits of marketing.
0422.5.5 Identify the 4 P's of the marketing mix.
0422.5.6 Illustrate the use of product positioning.
0422.5.7 Analyze variables in the consumer and industrial market (demographics, geographics, psychographics) that determine the target market.
0422.5.8 Construct a customer profile.

Standard 6: Basic Safety Techniques (0422.S.6)
Apply and Demonstrate Basic Safety Techniques.

Basic Safety Techniques Objectives
Students will:
0422.6.1 Demonstrate basic safety rules relevant to job safety by reading the appropriate operating instructions and explain the role of OSHA.
0422.6.2 Describe the first aid measures to be used in case of an emergency on the job, along with the procedures to be followed in case of an accident.
0422.6.3 Classify type A, B, and C fires and describe characteristics in order to extinguish properly.
0422.6.4 Discuss appropriate practices for handling and storing hazardous materials.
0422.6.5 Explain the role of OSHA.

Standard 7: Principles of Selling (0422.S.7)
Apply the Principles of Selling.

Principles of Selling Objectives
Students will:
0422.7.1 Identify the steps in the selling process.
0422.7.2 Identify the different approaches in the sales process.
0422.7.3 Identify the different methods of closing a sale.
0422.7.4 Choose the proper method of determining needs and handling objections in closing a sale.
0422.7.5 Conduct a sales presentation.

Standard 8: Consumer Characteristics (0422.S.8)
Analyze Consumer Characteristics and Behaviors as They Relate to Marketing Goods and Services.

Consumer Characteristics Objectives
Students will:
0422.8.1 Categorize buying transactions according to buying motives.
0422.8.2 Discuss how customers make buying decisions.
0422.8.3 Analyze external influences on the consumer buying decision.

Standard 9: Economic Principles (0422.S.9)
Describe the Importance of Economic Principles in Today's Society.

Economic Principles Objectives
Students will:
0422.9.1 Identify the various measurements used to analyze the economy.

0422.9.2 Distinguish between economic wants and needs.
0422.9.3 Define economic goods and services.
0422.9.4 Identify the resources (factors of production) that are used to satisfy wants and needs.
0422.9.5 Explain how scarcity affects the availability of economic goods and services.
0422.9.6 Explain the benefits of competition.
0422.9.7 Identify the opportunity costs and trade-offs involved in making choices.
0422.9.8 Explain the effects of the business cycle on consumers, businesses and government.
0422.9.9 Explain what an economy is.
0422.9.10 Discuss advantages and disadvantages of different types of economic systems.
0422.9.11 Discuss how an economic system addresses the questions (what is to be produced, how it is to be produced, and for whom).
0422.9.12 Analyze the relationship of price to scarcity.
0422.9.13 Describe how prices affect buying and selling decisions.
0422.9.14 Graph the concept of price on a supply and demand curve.

Standard 10: Business Ethics and Social Responsibility (0422.S.10)
Discuss Business Ethics and Social Responsibility.

Business Ethics and Social Responsibility Objectives
Students will:
0422.10.1 Explain the basic functions of a business.
0422.10.2 Name the areas in which businesses are thought to have social responsibilities.
0422.10.3 List ways that business activities have impacted the environment.
0422.10.4 Suggest how marketers can make ethical choices.
0422.10.5 Define consumerism.
0422.10.6 Describe current trends that are likely to improve the workplace for employees.

Standard 11: The Global Marketplace (0422.S.11)
Discuss the Importance of International Trade to Nations.

Global Marketplace Objectives
Students will:
0422.11.1 Distinguish between imports and exports.
0422.11.2 Discuss the interdependence of nations.
0422.11.3 Explain the advantages and disadvantages of international trade.
0422.11.4 Discuss the U.S. balance of trade.
0422.11.5 Identify trade barriers, trade support and trade agreements.
0422.11.6 Analyze how cultural, economic and political factors impact businesses engaged in international trade.

Marketing Principles II

Prerequisite: MARKETING PRINCIPLES
This course includes instructional areas designed to prepare for a career in the field of marketing and management. Instruction will prepare students to perform one or more of the marketing functions such as selling, promoting, marketing research, and management. The course can utilize cooperative education to support classroom instruction.

Standard 1: Cooperative Education
Demonstrate Knowledge of Cooperative Education (co-op).

Cooperative Education Objectives
The student will:
0425.1.1 Explain co-op objectives and procedures.
0425.1.2 Analyze co-op rules and regulations.
0425.1.3 Participate in a co-op or project experience.

Standard 2: Principles of Promotion
Demonstrate the Principles of Promotion.

Principles of Promotion Objectives
The student will:

0425.2.1 Define promotion and its role in the economy.
0425.2.2 Explain the role of an advertising agency.
0425.2.3 Describe the nature and scope of public relations and publicity.
0425.2.4 Apply the promotional mix to products and services.
0425.2.5 Determine the target market.
0425.2.6 Identify the types of advertising media and discuss the advantages and disadvantages of each type.
0425.2.7 Develop a print advertisement using effective headlines, copy, illustrations, layouts, color and type face for a product or service.
0425.2.8 Calculate cost per thousand advertising costs to determine cost effectiveness.
0425.2.9 Create visual merchandising displays using various types of display arrangements, color schemes, display backgrounds, mannequins and lighting.
0425.2.10 Prepare a broadcast advertisement.
0425.2.11 Calculate media cost.
0425.2.12 Compare and contrast the elements of visual merchandising.

Standard 3: Fundamentals of Distribution
Define the Fundamentals of Distribution.

Fundamentals of Distribution Objectives
The student will
0425.3.1 Demonstrate the flow of products in the channel of distribution.
0425.3.2 Choose the most cost-effective distribution channel for products.
0425.3.3 Calculate shipping costs using shipping terms.
0425.3.4 Describe three levels of distribution intensity.
0425.3.5 Identify transportation systems for the distribution of products.
0425.3.6 Identify various types of warehouses.

Standard 4: Analyze Pricing
Analyze Pricing Procedures.

Analyze Pricing Objectives
The student will
0425.4.1 Identify various pricing techniques.
0425.4.2 Identify the factors affecting selling price.
0425.4.3 Distinguish between market share and market position.
0425.4.4 Analyze the psychological effects of pricing in the consumer's buying behavior.
0425.4.5 Perform pricing calculations.
0425.4.6 Calculate break-even point, mark-up and markdown.
0425.4.7 Determine the selling price of a product or service.

Standard 5: Reducing Marketing Risk
Identify Techniques to Reduce Marketing Risk.

Reducing Marketing Risk Objectives
The student will
0425.5.1 Describe the types of risk that businesses encounter.
0425.5.2 Determine methods to prevent, reduce, control or transfer risks.
0425.5.3 Outline effective routine security precautions for a business.
0425.5.4 Identify methods of internal theft and shoplifting.

Standard 6: Business Purchasing Procedures
Identify Purchasing Procedures Used by a Business.

Business Purchasing Procedures Objectives
The student will
0425.6.1 Define purchasing and the procedures used in buying/purchasing.
0425.6.2 Explain the buying process.
0425.6.3 Select appropriate products to sell.
0425.6.4 Choose a vendor for a product.
0425.6.5 Decide proper inventory levels for products.
0425.6.6 Compare and contrast inventory control systems.
0425.6.7 Calculate merchandising related discounts and extensions.
0425.6.8 Describe how merchandise is received, checked and marked.
0425.6.9 Prepare purchase orders and invoices.

Standard 7: Finance Principles
Identify the Principles of Finance.

Principles of Finance Objectives
The student will
0425.7.1 Explain the functions of financing.
0425.7.2 Explain the purposes, types and importance of credit.
0425.7.3 Calculate interest cost.
0425.7.4 Summarize credit legislation.

Standard 8: Product/Service Planning
Identify the Aspects of Product/Servicing Planning

Product/Service Planning Objectives

0425.8.1 Explain the nature and scope of product planning.
0425.8.2 Analyze the steps in the consumer buying process.
0425.8.3 Research the impact of consumer protection provisions on the consumer's buying behavior using primary and secondary data.
0425.8.4 Describe extended product features such as warranties and contracts.
0425.8.5 List the principle functions of product packaging and labeling.
0425.8.6 Explain the nature and scope of branding.
0425.8.7 Define the product life cycle.
0425.8.8 Summarize the major provisions of product legislation.

Standard 9: Marketing Research
Define the Nature and Scope of Marketing Research.

Marketing Research Objectives
The student will
0425.9.1 Discuss the importance of marketing research in planning and implementing marketing strategies.
0425.9.2 Explain the function of a marketing information system.
0425.9.3 Describe the four important areas of marketing research.
0425.9.4 Describe the five steps in conducting marketing research.
0425.9.5 Write research instruments.
0425.9.6 Conduct marketing research to identify the market for a product or service.

Standard 10: Management Skills
Explain the Functions of Management.

Management Skills Objectives
The student will
0425.10.1 Describe how management teams are organized.
0425.10.2 Explain the functions of management.
0425.10.3 Analyze the advantages and disadvantages of a career in management.
0425.10.4 Identify management techniques.

Standard 11: Entrepreneurship
Examine Entrepreneurship Opportunities.

Entrepreneurship Objectives
The student will
0425.11.1 Define entrepreneurship.
0425.11.2 Identify the risks involved in entrepreneurship.
0425.11.3 Discuss the advantages and disadvantages of entrepreneurship.
0425.11.4 Identify the personal characteristics and skills entrepreneurs need.
0425.11.5 Discuss business ownership opportunities.

Marketing Work Experience/Internship

Marketing Work Experience/Internship is a method of instruction for students to receive on-the-job training that contributes to the over-all instructional program. The instruction, through written agreement between school and employers, is a combination of study in school with employment in the appropriate field. The related classroom instruction and on-the-job experiences are planned and supervised by employers and teacher coordinators to complete the student's education as to his/her career objective.

Standard 1: Human Relations Skills (0428.S.1)
Demonstrate Human Relations Skills.

Human Relations Skills Objectives
Students will:
0428.1.1 Demonstrate honesty and integrity.
0428.1.2 Use proper business ethics in all business activities.
0428.1.3 Demonstrate respect for customers, co-workers and management.
0428.1.4 Demonstrate initiative in completing job duties.
0428.1.5 Maintain a positive attitude and positive relationship with customers, co-workers and management.
0428.1.6 Adapt to changes in job responsibilities.
0428.1.7 Appreciate diversity in the workplace.
0428.1.8 Exhibit self-control when working with customers, co-workers and management.
0428.1.9 Use appropriate assertiveness.
0428.1.10 Exhibit empathy for customers, co-workers and management.
0428.1.11 Use feedback from others for personal growth.
0428.1.12 Practice proper business etiquette.
0428.1.13 Identify procedures to respond to sexual harassment.

Standard 2: Business Communications (0428.S.2)
Demonstrate Appropriate Business Communication Skills.

Communications Objectives
Students will:
0428.2.1 Use correct grammar and vocabulary in written and oral communications.
0428.2.2 Listen to and follow directions.
0428.2.3 Explain policies and procedures to customers and clients.
0428.2.4 Perform proper telephone techniques appropriately.
0428.2.5 Demonstrate the proper procedure for job termination.

Standard 3: Basic Work Skills (0428.S.3)
Demonstrate Mastery of Basic Work Skills for a Chosen Occupation.

Basic Work Skills Objectives
Students will:
0428.3.1 Maintain punctuality, appropriate attendance and dependability.
0428.3.2 Work independently without direct supervision.
0428.3.3 Stay with an assigned task until successful completion.
0428.3.4 Utilize time management principles when completing assignments.
0428.3.5 Apply organizational skills in daily activities.
0428.3.6 Participate as a team member when completing a work project.
0428.3.7 Produce quality work.

0428.3.8 Accept accountability for one's performance.
0428.3.9 Perform basic mathematical functions.
0428.3.10 Operate the most common electronic equipment with speed and accuracy.
0428.3.11 Maintain appropriate records for use on the job and in class.
0428.3.12 Demonstrate leadership skills when completing a project or task.
0428.3.13 Exhibit decision-making skills.
0428.3.14 Solve problems individually and as a team member.
0428.3.15 Participate in company meetings and activities.

Standard 4: Basic Safety Techniques (0428.S.4)
Apply and Demonstrate Basic Safety Techniques.

Basic Safety Techniques Objectives
Students will:
0428.4.1 Practice basic safety rules.
0428.4.2 Handle company equipment properly and safely.
0428.4.3 Demonstrate safety procedures for handling and lifting heavy materials.
0428.4.4 Follow procedures in the case of an accident, including reporting procedures.
0428.4.5 Follow security procedures.
0428.4.6 Practice proper safety procedures for handling and storing hazardous materials.
0428.4.7 Recognize and report hazardous conditions.
0428.4.8 Read and interpret operating instructions before using equipment.
0428.4.9 Explain and practice procedures for safe evacuation.
0428.4.10 Classify type A, B, and C fires and describe characteristics in order to extinguish properly.
0428.4.11 Identify proper agencies for safety procedures (fire department, police department, OSHA, hospital).

Professional Selling/Salesmanship

This course focuses on the purpose of the promotional strategy of selling and its role in the marketing environment. Emphasis is placed on the purpose and steps of the sales process, and the importance of completing each step in the presentation. Professional Selling as a career is also explored.

Standard 1: Fundamentals of Marketing (0431.S.1)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
The student will:

0431.1.1 Define the role of marketing and its importance.
0431.1.2 Explain the functions of marketing.
0431.1.3 State the marketing concept.
0431.1.4 Describe the economic benefits of marketing.
0431.1.5 Identify the 4 P's of the marketing mix.
0431.1.6 Illustrate the use of product positioning.
0431.1.7 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0431.1.8 Construct a customer profile.

Standard 2: Promotion (0431.S.2)
Define Promotion.

Promotion Objectives
The student will:

0431.2.1 Explain the role of promotion.
0431.2.2 Explain the concept of the promotional mix.
0431.2.3 Develop a promotional plan.
0431.2.4 Evaluate ethical standards of various promotional media.
0431.2.5 Distinguish between personal selling, advertising, publicity, sales promotion and visual merchandising.

Standard 3: Selling as a Promotional Tool (0431.S.3)
Explore Selling as a Promotional Tool.

Selling As a Promotional Tool Objectives
The student will:

0431.3.1 Identify the characteristics and benefits of selling.
0431.3.2 Explore sales as a career.
0431.3.3 Distinguish between the different types of sales positions.
0431.3.4 Identify the characteristics of a successful salesperson.
0431.3.5 Differentiate between consumer and industrial sales.
0431.3.6 Identify the steps in the sales process.
0431.3.7 Recognize cultural differences that are encountered in sales.
0431.3.8 Write a sales manual.
0431.3.9 Conduct a sales presentation.

Standard 4: Know Your Customer (0431.S.4)
Analyze the Importance of Knowing Your Customer.

Know Your Customer Objectives
The student will:
0431.4.1 Distinguish between rational and emotional buying motives.
0431.4.2 Explain the customer decision-making process.
0431.4.3 Differentiate between a consumer and a customer.
0431.4.4 Identify various customer personality types.

Standard 5: Product Knowledge (0431.S.5)
Analyze the Importance of Product Knowledge.

Product Knowledge Objectives
The student will:
0431.5.1 Identify features and benefits of a product or service.
0431.5.2 Demonstrate product/company knowledge needed for effecting selling.
0431.5.3 Research sources of product knowledge.

Standard 6: Preapproach Activities (0431.S.6)
Identify Preapproach Activities.

Preapproach Activities Objectives
The student will:
0431.6.1 Prepare a prospect list.
0431.6.2 Quality the customer for the list.
0431.6.3 Identify stock keeping and house keeping activities.
0431.6.4 Review sales records concerning the customer.
0431.6.5 Prepare sales materials.

Standard 7: Approach Activities (0431.S.7)
Identify Approach Activities.

Approach Activities Objectives
The student will:
0431.7.1 Discuss the purpose and importance of the approach.
0431.7.2 Identify types of retail approaches.
0431.7.3 Identify activities in the industrial approach.

Standard 8: Determine Customer Needs (0431.S.8)
Explain Why Determining Customer Needs is Essential in the Sales Process.

Determine Customer Needs Objectives
The student will:
0431.8.1 Describe methods used for determining customer needs.
0431.8.2 Discuss various questioning techniques.
0431.8.3 Consider the importance of nonverbal communication.
0431.8.4 Explain the necessity of effective listening.

Standard 9: Demonstration/Presentation (0431.S.9)
Identify Characteristics of a Demonstration/Presentation.

Demonstration/Presentation Objectives
The student will:

0431.9.1 Demonstrate how selling points are used in the demonstration/presentation.
0431.9.2 Explain how products are selected for the demonstration/presentation.
0431.9.3 Identify products to present to customer.
0431.9.4 Display the product for customer consideration.
0431.9.5 Involve the customer in the demonstration/presentation.
0431.9.6 Prepare sales aids.
0431.9.7 Utilize proper vocabulary to demonstrate product.
0431.9.8 Evaluate customer feedback.

Standard10: Handling Customer Objections and Questions (0431.S.10)
Identify Methods to Handle Objections and Questions.

Objections and Questions Objectives
The student will:
0431.10.1 Explain the difference between an excuse and an objection.
0431.10.2 Prepare an objection and analysis sheet.
0431.10.3 Identify common sources of objections.
0431.10.4 Explain the process of handling objections.
0431.10.5 Identify specialized methods of handling objections.
0431.10.6 Give examples of open ended and closed ended questions.

Standard11: Closing the Sale (0431.S.11)
Identify Techniques for Closing a Sale.

Closing the Sale Objectives
The student will:
0431.11.1 List buying signals that a customer sends.
0431.11.2 Explain the general rules for closing a sale.
0431.11.3 Describe specialized methods of closing the sale.
0431.11.4 Recognize the importance of closing the sale.
0431.11.5 Evaluate the reasons for failing to close a sale.
0431.11.6 Demonstrate methods of closing a sale.

Standard12: Suggestion Selling (0431.S.12)
Identify the Importance of Suggestion Selling.

Suggestion Selling Objectives
The student will:
0431.12.1 Identify the benefits of suggestion selling.
0431.12.2 Explain the rules of suggestion selling.
0431.12.3 Demonstrate methods of suggestion selling.

Standard13: Follow-Up Activities (0431.S.13)
Identify Follow-Up Activities.

Follow-Up Activities Objectives
The student will:
0431.13.1 Define the importance of relationship marketing.
0431.13.2 Summarize the importance of after-sale activities.
0431.13.3 Send thank you letters.
0431.13.4 Process payments.
0431.13.5 Identify sources of customer support.

Standard14: Selling Math Activities (0431.S.14)
Perform Selling Math Activities.

Selling Math Activities Objectives
The student will:

0431.14.1 Perform procedures associated with the handling of cash, credit cards, and checks (e.g. making change, preparing and closing cash drawers, correcting register errors).
0431.14.2 Describe the arrangement of currency and coins in a cash register.
0431.14.3 State the rules for safeguarding money in the cash register.
0431.14.4 Operate a calculator to calculate tax, discounts and net sales.
0431.14.5 Process exchanges, returns, allowances, layaways and other types of sales transactions.
0431.14.6 Prepare a purchase order and invoice.
0431.14.7 Calculate shipping costs.
0431.14.8 Identify methods of fraud protection.

Standard15: Sales Management (0431.S.15)
Identify Sales Management Activities.

Sales Management Activities Objectives
The student will:

0431.15.1 Track sales figures.
0431.15.2 Prepare a sales report.
0431.15.3 Identify techniques for motivating employees.
0431.15.4 Prepare sales goals.

Sports, Entertainment, Recreation In Marketing

This course includes instructional areas designed to prepare for a career in the field of sports, entertainment and/or recreational marketing. The function of Sports Marketing is to determine the interests of the consumer and plan a product or service that the spectator will buy.

Standard 1: Marketing Sports, Entertainment and Recreational Events (0434.SD.1)
Explain the Importance of Sports, Entertainment, and Recreation Marketing.

Importance of Marketing Sports, Entertainment and Recreational Events Objectives
The student will:
0434.1.1 Identify the place of sports, entertainment and recreation (SER) in the field of marketing.
0434.1.2 Identify SER careers.
0434.1.3 Analyze the growth and trends of SER as an industry in the local, state, national and international arenas.

Standard 2: Marketing and Business Overview (0434.SD.2)
Investigate an Overview of Marketing and Business.

Marketing and Business Objectives
The student will:
0434.2.1 Define the marketing functions.
0434.2.2 Identify the components of the marketing mix.
0434.2.3 State the marketing concept.
0434.2.4 Identify the use of market positioning.
0434.2.5 Explain the need and describe the methods of market research.
0434.2.6 Identify types of segmentation and determine the target market.
0434.2.7 Describe the four stages in the product life cycle.

Standard 3: Business Structure (0434.SD.3)
Explain the Business Structure of Sports, Entertainment, and Recreation.

Business Structure Objectives
The student will:
0434.3.1 Identify examples of business ownership.
0434.3.2 Explain reasons for operating as a profit or not-for-profit organization.
0434.3.3 Describe the partnership of business and government to develop SER opportunities.

Standard 4: Communication Strategies (0434.SD.4)
Develop Effective Communication Strategies.

Communication Strategies Objectives
The student will:
0434.4.1 Explain the components of the communication process.
0434.4.2 Identify listening strategies and barriers to effective communication.
0434.4.3 Compose written business communications.
0434.4.4 Interpret nonverbal communication.

Standard 5: Promotion (0434.SD.5)
Develop Promotion.

Promotion Objectives
The student will:

0434.5.1 Describe the five elements of the promotional mix.
0434.5.2 Differentiate between product and institutional promotions.
0434.5.3 Develop a logo, trademark, slogan and trade character.
0434.5.4 Describe the importance of selling.
0434.5.5 Identify the steps of a sale.
0434.5.6 Describe the four major types and uses of sales promotion.
0434.5.7 Develop a promotion campaign.
0434.5.8 Identify the responsibilities of a Sports Information Director or Public Relations person.
0434.5.9 Explain the composition of the media and effective ways to work with each.
0434.5.10 Develop a media/press release, letterhead, mailing list and PSA.
0434.5.11 Explain the types of advertising media.
0434.5.12 Describe the elements of an advertisement.

Standard 6: Sponsorship (0434.SD.6)
Analyze the Purpose of Sponsorship.

Sponsorship Objectives
The student will:
0434.6.1 Explain the reasons for a company to use sponsorship.
0434.6.2 Explain the sociological rationales for buying into sports and entertainment.
0434.6.3 Identify reasons for athlete/entertainer endorsements.
0434.6.4 Evaluate a sponsorship marketing plan/proposal and discuss legal issues.
0434.6.5 Analyze the pricing of sponsorships.

Standard 7: Legal Considerations (0434.SD.7)
Investigate Legal Considerations.

Legal Considerations Objectives
The student will:
0434.7.1 Explain expressed, implied, unilateral and bilateral contracts.
0434.7.2 Identify essential elements of contracts and the legal implications.
0434.7.3 Explain the role of licensing.

Standard 8: Agents and Personal Managers (0434.SD.8)
Examine the Role of Agents and Personal Managers.

Agents and Personal Managers Objectives
The student will:
0434.8.1 Identify the role of agents and personal managers.
0434.8.2 Explain the types of agreements/contracts and financial compensation.
0434.8.3 Identify the factors involved in selection of an agent/personal manager.
0434.8.4 Identify the agent's role in pre-negotiations and endorsement contracts.

Standard 9: Labor Unions (0434.SD.9)
Appraise the Role of Labor Unions.

Labor Union Objectives
The student will:
0434.9.1 Examine the role of unions in sports, entertainment, and recreation marketing.
0434.9.2 Explain the use of collective bargaining in union negotiations.

Standard 10: Business Ethics (0434.SD.10)
Explore Business Ethics.

Business Ethic Objectives
The student will:
0434.10.1 Explain management's role in ethical practices.
0434.10.2 Describe ways to improve ethical behavior in business.
0434.10.3 Explain bootlegging and the ways companies are affected.

Standard 11: Risk Management (0434.SD.11)
Explain the Importance of Risk Management.

Risk Management Objectives
The student will:
0434.11.1 Identify risks.
0434.11.2 Analyze the importance of security and insurance.
0434.11.3 Determine methods to prevent, reduce, control or transfer risks.

Standard 12: Event Planning (0434.SD.12)
Develop and Plan an Event.

Event Planning Objectives
The student will:
0434.12.1 Analyze the growth and trends of event planning.
0434.12.2 Explore sports or entertainment events.
0434.12.3 Illustrate job duties in event planning.
0434.12.4 Develop an event plan.
0434.12.5 Evaluate the event plan.

Standard 13: Financial Planning (0434.SD.13)
Determine the Importance of Financial Planning.

Financial Planning Objectives
The student will:
0434.13.1 Identify sources of costs for SER businesses.
0434.13.2 Explain net profit/net loss and how it is calculated.
0434.13.3 Identify the components of a budget.
0434.13.4 Identify revenue sources.

Standard 14: Product Development (0434.SD.14)
Analyze Product Development.

Product Development Objectives
The student will:
0434.14.1 Describe types of concessions.
0434.14.2 Identify factors affecting product development and concessions.
0434.14.3 Define internal/external merchandise opportunities.

Tour/Hospitality Marketing

This course focuses on the importance of marketing in the tourism and hospitality industry. Careers in the tourism and hospitality are also explored.

Standard 1: Fundamentals of Marketing (0437.S.1)
Describe the fundamentals of marketing.

Fundamentals of Marketing Objectives
The student will:

0437.1.1 Describe the environment for marketing in the hospitality and travel industry.
0437.1.2 Define the role of marketing and its importance.
0437.1.3 Explain the functions of marketing.
0437.1.4 State the marketing concept.
0437.1.5 Describe the economic benefits of marketing.
0437.1.6 Identify the 4 P's of the marketing mix.
0437.1.7 Illustrate the use of product positioning.
0437.1.8 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0437.1.9 Construct a customer profile.

Standard 2: Marketing and Travel (0437.S.2)
Identify the importance of marketing in the travel industry.

Marketing and Travel Objectives
The student will:

0437.2.1 Explain the meaning of services marketing.
0437.2.2 Differentiate between the marketing of services and the marketing of products.
0437.2.3 Discuss the fundamentals of the hospitality and travel marketing system.
0437.2.4 List the benefits of using the hospitality and travel marketing system.
0437.2.5 Define long- and short-term marketing planning.
0437.2.6 Distinguish between a strategic market plan and a marketing plan.

Standard 3: Marketing Opportunities in Tourism and Hospitality (0437.S.3)
Analyze marketing opportunities.

Marketing Opportunities Objectives
The student will:

0437.3.1 Differentiate between situation, market and feasibility analyses.
0437.3.2 Describe the steps in a situation analysis.
0437.3.3 Describe the steps in a market analysis.
0437.3.4 Describe the steps in a feasibility analysis.

Standard 4: Marketing Research (0437.S.4)
Analyze the importance of marketing research.

Marketing Research Objectives
The student will:

0437.4.1 Discuss the importance of marketing research in planning and implementing marketing strategies.
0437.4.2 Explain the function of a marketing information system.
0437.4.3 Describe the four important areas of marketing research.

0437.4.4 Describe the five steps in conducting marketing research.
0437.4.5 Write research instruments.
0437.4.6 Conduct marketing research to identify the market.
0437.4.7 Discuss the criteria used to determine the viability of market segments.
0437.4.8 List the bases that can be used to segment hospitality and travel markets.
0437.4.9 Describe the major demand and supply trends that influence the industry.
0437.4.10 Describe how the effectiveness of various marketing strategies varies with the product life cycle and an organization's position in the industry.
0437.4.11 Identify the factors that have made positioning essential in the industry.
0437.4.12 Describe the approaches to positioning.

Standard 5: Customer Behavior (0437.S.5)
Discuss customer behavior.

Customer Behavior Objectives
The student will:
0437.5.1 Describe personal factors that influence customer behavior.
0437.5.2 Explain the factors that influences customers' perception of the industry.
0437.5.3 Describe interpersonal factors that influence customer behavior.
0437.5.4 List the steps in the customer buying process.

Standard 6: Marketing Plan (0437.S.6)
Write a marketing plan.

Marketing Plan Objectives
The student will:
0437.6.1 Identify the characteristics of a marketing plan.
0437.6.2 List requirements for an effective marketing plan.
0437.6.3 Explain the benefits of having a marketing plan.
0437.6.4 Complete a demographic study to determine a market.
0437.6.5 Determine market potential.
0437.6.6 Identify direct and indirect competition.
0437.6.7 Evaluate competitive strengths and weaknesses.
0437.6.8 State the marketing concept.
0437.6.9 Utilize market segmentation and target marketing.
0437.6.10 Identify and apply the components of the marketing mix.
0437.6.11 Explain approaches to develop a marketing budget.

Standard 7: Product Development (0437.S.7)
Analyze the importance of product development.

Product Development Objectives
The student will:
0437.7.1 Identify the components of an organization's product/service mix.
0437.7.2 Explain the steps in product development.
0437.7.3 Explain the potential benefits of marketing partnerships to hospitality and travel organizations.

Standard 8: People and Service Quality (0437.S.8)
Explain why people and service quality are important to the industry.

People and Service Quality Objectives
The student will:
0437.8.1 Explain the key role played by people in the marketing mix.
0437.8.2 Describe the total quality management (TQM) concept.
0437.8.3 Explain the importance of employee selection, orientation, training and motivating programs.
0437.8.4 Describe the concept of empowering employees.
0437.8.5 Describe the customer mix.

Standard 9: Distribution (0437.S.9)
Explain distribution in the industry.

Distribution Objectives
The student will:
0437.9.1 Differentiate between the distribution mix in the hospitality and travel industry and other industries.
0437.9.2 List the major travel trade intermediaries.
0437.9.3 Explain the roles played by each of the major travel trade intermediaries.

Standard10: Communication and the Promotional Mix (0437.S.10)
Identify the connection between communication and the promotional mix.

Communication and the Promotional Mix Objectives
The student will:
0437.10.1 List the elements of the promotional mix.
0437.10.2 Explain the communication process.
0437.10.3 Describe how the customer's buying process stage and the buying decision classification influence the effectiveness of promotions.
0437.10.4 Discuss the goals of promotion.
0437.10.5 Explain the relationship of the promotional mix and the marketing mix.

Standard11: Advertising (0437.S.11)
Identify the importance of advertising in the industry.

Advertising Objectives
The student will:
0437.11.1 Identify the various types of media.
0437.11.2 Analyze the advantages and disadvantages of each type of media.
0437.11.3 Select the appropriate media for the target market.
0437.11.4 Identify standards for selecting advertising media.
0437.11.5 Evaluate the effectiveness of the advertising media.
0437.11.6 Explain the difference between consumer and trade advertising.
0437.11.7 Explain how the hospitality and travel industry tends to use advertising.
0437.11.8 Describe the role of advertising agencies.

Standard12: Sales Promotion (0437.S.12)
Identify the importance of sales promotion in the industry.

Sales Promotion Objectives
The student will:
0437.12.1 Identify the characteristics and benefits of sales promotion.
0437.12.2 Differentiate between the various types of sales promotion.

0437.12.3 Analyze the advantages and disadvantages of the various types of sales promotion.
0437.12.4 Select appropriate sales promotion.
0437.12.5 Explain the difference between special communication and special offer promotions.
0437.12.6 Develop a sales promotion.
0437.12.7 Evaluate the effectiveness of a sales promotion.

Standard13: Personal Selling (0437.S.13)
Identify the importance of personal selling in the industry.

Personal Selling Objectives
The student will:
0437.13.1 Identify the characteristics and benefits of selling.
0437.13.2 Differentiate between consumer and industrial sales.
0437.13.3 Describe the characteristics of the successful salesperson.
0437.13.4 Identify the steps in the sales process.
0437.13.5 Recognize cultural differences that are encountered in sales.
0437.13.6 Conduct a sales presentation.

Standard14: Public Relations (0437.S.14)
Identify the importance of public relations in the industry.

Public Relations Objectives
The student will:
0437.14.1 Identify the characteristics and benefits of public relations and publicity.
0437.14.2 Identify the audiences for public relations.
0437.14.3 Describe the steps in developing a public relations plan.
0437.14.4 Identify the vehicles used for public relations and publicity.
0437.14.5 Explain the role and advantages of public relations consultants.
0437.14.6 Write a media release.

Early Childhood & Educational Services I

Early Childhood and Educational Services provides the integrated knowledge, skill, and practices required for careers in early childhood education and services.

Standard 1: Developmental Practices (1001.S.1)
The student will analyze developmentally appropriate practices to plan for early childhood education and services.

Developmental Practices Objectives
The students will:
1001.1.1 Examine child development theories and their applications for educational and childcare practices as they relate to physical, social, emotional, and cognitive development of children.*
1001.1.2 Determine a variety of assessment methods to observe and interpret children's growth and development.*
1001.1.3 Consider cultural and environmental influences when assessing children's development.*
1001.1.4 Determine special needs of children.
1001.1.5 Put into effect strategies that promote children's growth and development.*

Standard 2: Developmental Needs and Interests (1001.S.2)
The student will demonstrate integration of curriculum and instruction to meet children's developmental needs and interests.

Developmental Needs and Interests Objectives
The students will:
1001.2.1 Examine a variety of curriculum and instructional models.*
1001.2.2 Implement learning activities in all curriculum areas that meet the developmental needs of children.*
1001.2.3 Implement an integrated curriculum that incorporates a child's language, learning styles, home experiences, and cultural values.*
1001.2.4 Demonstrate a variety of teaching methods to meet individual needs of children.*
1001.2.5 Arrange learning centers that provide for children's exploration, discovery, and development.
1001.2.6 Establish activities, routines, and transitions.

Standard 3: Learning Environment (1001.S.3)
The student will demonstrate a safe and healthy learning environment for children.

Learning Environment Objectives
The student will:
1001.3.1 Manage physical space to maintain a safe and healthy learning environment.*
1001.3.2 Apply safe and healthy practices that comply with state regulations.*
1001.3.3 Implement strategies to teach children health, safety, and sanitation habits.*
1001.3.4 Provide safe and healthy meals and snacks.*
1001.3.5 Document symptoms of child abuse and neglect and use appropriate procedures to report suspected abuse or neglect to the designated authorities.
1001.3.6 Implement basic health practices and prevention procedures for workers and children regarding childhood illness and communicable diseases.*
1001.3.7 Demonstrate security and emergency procedures.

**Instructional goals and objectives have been correlated with the United States Department of Labor Child Development Specialist curriculum.*
** Child Development Specialist 1*

Early Childhood And Educational Services II

Early Childhood and Educational Services provides the integrated knowledge, skills, and practices required for careers in early childhood education and services.

Standard 1: Career Paths (1002.S.1)
The student will analyze career paths within early childhood education and services

Career Paths Objectives
The student will:
1002.1.1 Determine the roles and functions of individuals engaged in early childhood education and services.*
1002.1.2 Explore opportunities for employment and entrepreneurial endeavors.
1002.1.3 Examine education and training requirements and opportunities for career paths in early childhood education and services.
1002.1.4 Examine the impact of early childhood education and services occupations on local, state, national, and global economies.

Standard 2: Relationships (1002.S.2)
The student will demonstrate techniques for positive collaborative relationships with children.

Relationships Objectives
The student will:
1002.2.1 Establish developmentally appropriate guidelines for behavior.
1002.2.2 Demonstrate problem-solving skills with children.*
1002.2.3 Demonstrate interpersonal skills that promote positive and productive relationships with children.*
1002.2.4 Implement strategies for constructive and supportive interactions between children and families.
1002.2.5 Present information to parents regarding developmental issues and concerns related to children.

Standard 3: Practices and Standards (1002.S.3)
The student will demonstrate professional practices and standards related to working with children.

Practices and Standards Objectives
The student will:
1002.3.1 Utilize opportunities for continuing training and education.
1002.3.2 Apply professional ethical standards as accepted by the recognized professional organizations.
1002.3.3 Implement federal, state, and local standards, policies, regulations, and laws which impact children, families, and programs.
1002.3.4 Demonstrate enthusiasm, initiative, and commitment to program goals and improvements.
1002.3.5 Apply business management skills to planning businesses in early childhood education and services.

**Instructional goals and objectives have been correlated with the United States Department of Labor Child Development Specialist curriculum.*

** Child Development Specialist 1*

ProStart I (1011 or 1951)

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete 400 hour off-campus, paid internship. This first course focuses on the basics of preparing and service safe food, preventing accidents, using foodservice equipment and preparing certain types of foods. It also addresses the business topics of human relations, customer service, controlling costs and certain math concepts.

Standard 1: Prepare for a successful career in foodservice management. (1011.S.1)

Foodservice Management Objectives
Students will:

1011.1.1 Recognize how the foodservice industry provides a unique workplace environment.
1011.1.2 Describe the importance of service to success in foodservice
1011.1.3 Describe the elements of excellent service.
1011.1.4 Identify ways to speak to customers and coworkers.
1011.1.5 Identify career opportunities within the foodservice industry.
1011.1.6 Describe the steps in looking for a job.
1011.1.7 Complete the necessary documents for a job interview including the resume, cover letter, and application.
1011.1.8 Participate in a job interview.

Standard 2: Prepare and serve safe food. (1011.S.2)

Safe Food Objectives
Students will:

1011.2.1 Demonstrate proper sanitary procedures for use in food service.
1011.2.2 Show how contamination and cross-contamination is most likely to occur.
1011.2.3 List the major causes of foodborne illnesses, and describe potentially hazardous foods.
1011.2.4 Describe the micro-organisms that cause foodborne illnesses and the conditions in which they thrive.
1011.2.5 Demonstrate safe and proper procedures for receiving, storing, preparing, holding, and serving food.
1011.2.6 Describe ways to prevent infestation by pests.

Standard 3: Practice safe workplace habits. (1011.S.3)

Safe Workplace Objectives
Students will:

1011.3.1 Demonstrate proper safety procedures commonly used in foodservice operations.
1011.3.2 Describe the role of OSHA regulations and explain the Hazard Communication Standard requirements for employers.
1011.3.3 Demonstrate proper procedures for reducing accidents involving fire, slips, trips, falls, lifting and carrying, cuts and equipment.

Standard 4: Demonstrate the basics food preparation. (1011.S.4)

Food Preparation Objectives

Students will:

1011.4.1 Describe the various liquid and dry cooking methods and the foods to which they are best suited.

1011.4.2 Read and follow standardized recipes, describing their components and functions, and convert them to smaller and larger quantities.

1011.4.3 Explain the functions of different types of knives and demonstrate their proper use.

1011.4.4 Identify the tools commonly used in food service for wet and dry measure and demonstrate understanding of equivalence of standard American and metric measures.

1011.4.5 Define common cooking and foodservice terms.

Standard 5 :Operate foodservice equipment safely and effectively. (1011.S.5)

Foodservice Equipment Objectives

Students will:

1011.5.1 List and describe the equipment commonly used in the receiving, storage, food preparation, baking, holding and service, bar, dishwashing and waste disposal areas.

1011.5.2 List and describe the measuring utensils, hand tools, knives, pots and pans commonly used in a food service operation.

1011.5.3 Discuss how to troubleshoot the maintenance and repair of mixers, slicers, steamers, broilers, ranges, grills, fryers, ovens, food warmers, coffee urns, dishwashers and waste disposal systems.

1011.5.4 Discuss the role of the health inspector and how managers get ready for inspections.

Standard 6: Discuss the role of nutrition in a food service operations. (1011.S.6)

Nutrition in Food Service Operations Objectives

Students will:

1011.6.1 Explain the role of Recommended Dietary Allowances (RDAs) and the Food Guide Pyramid in planning healthful meals.

1011.6.2 Plan interesting, appealing and nutritionally balanced meals.

1011.6.3 Demonstrate cooking methods and identify recipes that preserve nutrients in quantity cooking.

Standard 7: Prepare sandwiches and breakfast foods. (1011.S.7)

Sandwiches and Breakfast Foods Objectives

Students will:

1011.7.1 Explain the roles of the production sheet, daily food cost sheet, sales history, and sales mix record in quantity food production.

1011.7.2 Perform total food cost and food cost percentage calculations.

1011.7.3 Determine the total cost and portion cost of standardized recipes.

1011.7.4 Explain the roles of the three components of a sandwich: bread, spread and filling.

1011.7.5 Compare and contrast the various types of sandwich: simple hot, open-faced, deep-fried, simple cold, tea and canapé.

1011.7.6 Set up a safe, sanitary, and efficient sandwich station.

1011.7.7 List the various forms in which milk is available and define pasteurize and homogenize.

1011.7.8 Compare and contrast current, aged, and processed cheeses and give examples of each.

1011.7.9 Describe the methods for cooking eggs: boiled, baked, shirred, poached, fried, scrambled, deviled, omelet, quiche, and soufflé.

1011.7.10 Prepare common breakfast food: pancakes and similar foods, eggs, breakfast cereals and breakfast meats.

Standard 8: Prepare salads and garnishes. (1011.S.8)

Salads and Garnishes Objectives
Students will:
1011.8.1 Discuss characteristic of the various ingredients that can be used to make both common and unusual salads.
1011.8.2 Prepare and store salads properly.
1011.8.3 Demonstrate techniques used to prepare garnishes
1011.8.4 Discuss common salad dressings and condiments.

Standard 9: Understand personnel management techniques. (1011.S.9)

Personnel Management Techniques Objectives
Students will:
1011.9.1 Demonstrate quality customer service techniques.
1011.9.2 Describe the elements involved in staff planning, recruiting, interviewing, and selecting employees
1011.9.3 Discuss effective methods of motivating and retaining employees
1011.9.4 Show techniques used to conduct and effective employee evaluation.

Standard 10: Prepare fruits and vegetables. (1011.S.10)

Fruits and Vegetables Objectives
Students will:
1011.10.1 Describe and identify the various varieties of fruits and vegetables and the forms in which they are available (fresh, frozen etc.).
1011.10.2 List seasons in which fresh fruits and vegetables are at their best quality and lowest price.
1011.10.3 Match different cooking methods to various fruits and vegetables.
1011.10.4 Explain how to properly select and purchase, receive, store, and handle fruits and vegetables.
1011.10.5 Prepare fruits and vegetables in a variety of ways.

Standard 11: Control food service costs. (1011.S.11)

Food Service Costs Objectives
Students will:
1011.11.1 Perform basic math operations as they relate to foodservice operations: i.e., determine percentages, convert recipes, convert form American and metric units of measure, approximate recipe yields.
1011.11.2 Describe different types of costs related to food, beverage and labor: controlled costs, fixed costs, variable costs, etc.
1011.11.3 Demonstrate operational procedures for preventing waste of food ad beverage.
1011.11.4 Show proper use of recipes, glassware, utensils, production sheets and other tools that help control waste.
1011.11.5 Determine menu prices using various methods.
1011.11.6 Illustrate the cost percentage formula and apply it to operational procedures.
1011.11.7 Describe and apply procedures used in planning and forecasting to control food, beverage and labor costs.

ProStart II (1012 or 1952)

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship. This second course focuses on the basics of quality table service, menu planning, industry careers and preparing certain types of foods. It also addresses the business topics of marketing, communication, accounting, purchasing, and inventory control.

Standard 1: Prepare Potatoes, Grains and Pasta (1012.S.1)

Prepare Potatoes, Grains and Pasta Objectives
Students will:
1012.1.1 Explain how to properly select, receive, and store potatoes, grains and pasta.
1012.1.2 Match different cooking methods to potatoes, grains and pasta.
1012.1.3 Prepare potatoes, grains and pasta using a variety of recipes and cooking techniques.

Standard 2: Explain the characteristics, activities, opportunities and types of lodging operations. (1012.S.2)

Lodging Operations Objectives
Students will:
1012.2.1 Define the term "lodging property" and discuss each of the characteristic types of lodging operations.
1012.2.2 List and discuss the five key elements that differentiate one lodging establishment from another.
1012.2.3 Identify the two national organizations that rate commercial lodging establishments and list a minimum of five factors used by each in making their judgments.
1012.2.4 Identify ten services offered by some, but not all, lodging properties.
1012.2.5 Discuss career opportunities in the lodging industry and the qualifications commonly sought by lodging employers.
1012.2.6 Name the activities generally accomplished at the front desk, in housekeeping, in the front office and by engineering.
1012.2.7 Describe the different types of rates and what makes them different.

Standard 3: Demonstrate the techniques necessary for quality table service. (1012.S.3)

Table Service Objectives
Students will:
1012.3.1 Set a table properly for guests arrival.
1012.3.2 Set and clear items properly.
1012.3.3 Demonstrate different service styles: American, French, English, Russian, buffet, counter and cafeteria.
1012.3.4 Describe the traditional service staff and the duties and responsibilities of each staff position.
1012.3.5 Present a guest check, receive payment, and say good-bye to guest properly.
1012.3.6 Identify various dining utensils.
1012.3.7 Perform several tableside service and food preparation techniques.
1012.3.8 Show how servers should properly identify, describe and recommend menu items to guests.

Standard 4: Prepare desserts and baked goods. (1012.S.4)

Desserts and Baked Goods Objectives
Students will:
1012.4.1 Identify the functions of basic ingredients used in desserts and breads.
1012.4.2 Describe common desserts and methods used to prepare them.
1012.4.3 Prepare various desserts and baked goods and store them properly.
1012.4.4 Bake different types of breads and quick breads.

Standard 5: Plan an effective menu. (1012.S.5)

Menu Objectives
Students will:
1012.5.1 Characterize various menu types - a la carte, table d'hôte, California, du jour, cycle - and the operations in which they are most commonly used.
1012.5.2 Write descriptions of menus items using appetizing language.
1012.5.3 Critique the physical layout of a menu.

Standard 6: Describe how marketing techniques are used in food service. (1012.

Marketing Techniques Objectives
Students will:
1012.6.1 Describe the basic marketing concepts and terms.
1012.6.2 Describe the elements of a marketing plan.
1012.6.3 Describe elements of successful community and public relations.
1012.6.4 Write and effective press release. LA
1012.6.5 Explain the various advertising media and advantages and disadvantages of each.
1012.6.6 Plan a successful promotional campaign using commonly used professional tools.

Standard 7: Practice appropriate purchasing and inventory control procedures. (1012.S.7)

Purchasing and Inventory Control Objectives
Students will:
1012.7.1 Determine when and how often to order inventory items using both perpetual and physical inventory methods
1012.7.2 Prepare purchase specifications and purchase orders for items to be purchased.
1012.7.3 Explain the formal bidding process.
1012.7.4 Describe the factors involved in selecting appropriate suppliers.
1012.7.5 Describe proper receiving procedures.
1012.7.6 Explain procedures used to issue items and keep track of inventory.

Standard 8: Prepare meats, poultry and seafood. (1012.S.8)

Meats, Poultry and Seafood Objectives
Students will:
1012.8.1 Explain the federal grading systems for meat, poultry, fish and shellfish.
1012.8.2 Describe the various forms of meat, poultry, fish and shellfish.
1012.8.3 Discuss proper procedures for receiving, storing, and handling meat, poultry, fish and shellfish.
1012.8.4 Prepare meat, poultry, fish and shellfish using a variety of cooking methods and recipes.

Standard 9: Use Standard Accounting Practices. (1012.S.9)

Accounting Objectives
Students will:
1012.9.1 Demonstrate basic accounting principles and apply them to common foodservice scenarios.
1012.9.2 Practice double-entry accounting (recording transactions in balanced T accounts).
1012.9.3 Read and interpret income statements and balance sheets
1012.9.4 Calculate cost of sales using opening and closing inventory figures.
1012.9.5 Use the balance sheet equation to determine assets, liabilities and owners equity.

Standard 10: Prepare soups, stocks and sauces. (1012.S.10)

Soups, Stocks and Sauces Objectives
Students will:
1012.10.1 List the common ingredients of and describe the proper procedure for, making a quality stock.
1012.10.2 Prepare a stock.
1012.10.3 Describe common soups and how they are prepared.
1012.10.4 Prepare various soups.
1012.10.5 Identify the major sauce families and the sauces derived from them.
1012.10.6 Prepare quality sauces using proper procedures.

Standard 11: Describe the characteristics, components and opportunities of the tourism industry. (1012.S.11)

Tourism Objectives
Students will:
1012.11.1 Describe the role of travel and tourism in the hospitality industry.
1012.11.2 Recognize career opportunities offered in travel and tourism.
1012.11.3 Distinguish the segments that make up the travel industry.
1012.11.4 Describe the kinds of customer service skills required of people who work in the travel industry.

Standard 12: Communicate well with customers. (1012.S.12)

Communications Objectives
Students will:
1012.12.1 Display basic speaking and listening skills.
1012.12.2 Use effective writing skills in all forms of written communications.
1012.12.3 Display proper and courteous telephone skills.
1012.12.4 Describe menu items effectively and demonstrate suggestive selling techniques.

Standard 13: Complete a 400-hour, off-campus, paid internship in a food service establishment. (1012.S.13)

Internship Objectives:
Students will:
1012.13.1 Develop personal qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1012.13.2 Develop long-term work qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1012.13.3 Develop short-term observable skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.

Basic Control Circuits

This course will introduce students to basic electricity fundamentals, including all related math calculations required. Ohm=s law, various circuits, reading schematic diagrams, and troubleshooting electrical circuits will be covered.

Standard 1: Troubleshoot, test, and repair or replace electrical components. (1601.S.1)

Troubleshoot, Test, And Repair Or Replace Electrical Components Objectives

Students will:

1601.1.1 Troubleshoot electrical faults on series and parallel circuit and calculate unknown values.
1601.1.2 Measure resistance of open and hermetic motor windings.
1601.1.3 Test and replace split phase motors (PSC, RSIR, CSCR, CSIR, and Shaded Pole).
1601.1.4 Test and install motor starting relays (Current, hot wire, potential, solid state).
1601.1.5 Test and replace capacitor (start and run).
1601.1.6 Test and replace contactors, switching relays, overload protectors, transformers and resistance heaters.
1601.1.7 Inspect, replace and repair switches, male and female plugs.
1601.1.8 Identify types of thermostats, test, install and adjust heat anticipators.

Domestic Refrigeration

This course covers testing, analyzing, and repair of domestic refrigeration systems (refrigerators, air conditioners, central air conditioning, and dehumidifiers).

Standard 1: Demonstrate testing & service skills for domestic refrigeration systems. (1603.S.1)

Demonstrate Testing & Service Skills For Domestic Refrigeration Systems Objectives
Students will:

1603.1.1 Label all components (electrical and mechanical) on domestic refrigeration systems.
1603.1.2 Test and replace all components (electrical and mechanical) of domestic refrigeration systems.
1603.1.3 Test and record temperature, relative humidity and pressure controls.

Fundamentals of Air Conditioning/Refrigeration

This course will introduce students to the air conditioning, and refrigeration field. Students will become familiar with the skills needed in basic compression refrigeration.

Standard 1: Identify, explore, and evaluate career opportunities related to air conditioning and refrigeration. (1605.S.1)

Career Opportunities Related to Air Conditioning and Refrigeration Objectives
Students will:

1605.1.1 Describe a variety of careers related to air conditioning and refrigeration, and the training necessary to be successful in those careers.
1605.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of air conditioning and refrigeration.
1605.1.3 Identify sources of information about careers in air conditioning and refrigeration.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to air conditioning and refrigeration. (1605.S.2)

Basic Safety Rules and Equipment Objectives
Students will:

1605.2.1 Recognize and follow general shop safety guidelines.
1605.2.2 Select and wear appropriate protective equipment.
1605.2.3 Demonstrate the proper selection and use of fire extinguishers.
1605.2.4 Identify and demonstrate proper use and care of all basic personal safety equipment.
1605.2.5 Describe safety precautions necessary when using hazardous materials.

Standard 3: Perform fabrication operations with copper, brass and steel tubing. (1605.S.3)

Fabrication Operations with Copper, Brass and Steel Tubing Objectives
Students will:

1605.3.1 Differentiate between hard and soft copper tubing.
1605.3.2 Construct a flare joint, a swage joint, and bend copper tubing to specific angles.
1605.3.3 Set up an oxyacetylene welding station, light and adjust the torch.
1605.3.4 Solder brass and copper fittings to copper tubing.
1605.3.5 Silver braze steel and copper tubing.
1605.3.6 Measure, cut and repair capillary tube.

Standard 4: Demonstrate knowledge and skills needed in compression refrigeration. (1605.S.4)

Knowledge and Skills Needed In Compression Refrigeration Objectives
Students will:

1605.4.1 Locate and label components of compression refrigeration system.
1605.4.2 Identify effect of CFC on ozone atmosphere.
1605.4.3 Install access fittings on a hermetic sealed system.
1605.4.4 Recover refrigerant, locate and repair, pressurize and leak test, evacuate, and recharge with vapor and liquid.
1605.4.5 Install manifold gauges on refrigeration systems and use a P/T chart to test compressor operation.
1605.4.6 Replace filter driers using flare fittings and sweat fittings, then triple evacuate to eliminate any moisture.
1605.4.7 Convert temperature to pressure.

Heating Systems

This course will introduce students to the basic operational theory of furnaces (gas, oil, electric, and heat pumps). Students will perform various testing and adjusting of components and circuits.

Standard 1: Demonstrate knowledge and skill needed to test, service, install and repair heating systems. (1607.S.1)

Demonstrate Knowledge And Skill Needed To Test, Service, Install And Repair Heating Systems Objectives

Students will:

1607.1.1 Test and replace all electrical and mechanical components and safety devices of heating systems.
1607.1.2 Leak test and adjust pressures of fossil fuel heating systems.
1607.1.3 Measure and adjust temperature rise of heating systems.
1607.1.4 Test and adjust combustion efficiency of fossil fuel heating systems.
1607.1.5 Check and install electric base board heating systems.
1607.1.6 Convert watts to B.T.U.=s, Celsius to Fahrenheit.
1607.1.7 Compare electric heat and heat pumps to fossil fuel heating systems.
1607.1.8 Light and adjust pilot light flame.
1607.1.9 Identify installing considerations of heating systems (up flow, down flow, and horizontal).
1607.1.10 Install fuel lines and filters for gas and oil furnaces (black pipe and copper tubing).
1607.1.11 Compute heat loss and heat gain, design duct system from blueprint information and measure airflow through duct system.

Applications For Network and Hardware WVEIS Code 1611

Content Standards for this course are under development.

Basic System Operations And Applications

WVEIS Code 1613

Content Standards for this course are under development.

Computer Construction

WVEIS Code 1615

Content Standards for this course are under development.

Servers And Network Operations

WVEIS Code 1617

Content Standards for this course are under development.

Alternative Fuels

This course will introduce students to basic electrical and automotive fundamentals related an electric vehicle including the math calculations required.

Standard 1: Demonstrate electrical safety. (1621.S.1)

Electrical Safety Objectives
Students will:
1621.1.1 Describe the effect of current on the human body.
1621.1.2 List general safety precautions when working with electricity.
1621.1.3 Identify various types of safety devices used with electricity.
1621.1.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1621.1.5 List and describe the safe use of basic hand and power tools used in the field of electricity.
1621.1.6 List and explain personal and electrical safety rules applicable to rotating equipment.

Standard 2: Interpret blueprints, schematics and technical orders. (1621.S.2)

Blueprints, Schematics and Technical Orders Objectives
Students will:
1621.2.1 Demonstrate knowledge of blueprint reading.
1621.2.2 Demonstrate knowledge of schematic reading.
1621.2.3 Draw a block diagram of a motor control system.
1621.2.4 Demonstrate knowledge of elementary wiring diagrams and ladder logic.
1621.2.5 Install motor control centers and systems, using wiring diagrams.
1621.2.6 List and identify motor and motor control symbols.

Standard 3: Apply electrical math concepts. (1621.S.3)

Electrical Math Concepts Objective
Students will:
1621.3.1 Demonstrate knowledge of Ohm's law and power formulas.

Standard 4: Demonstrate the proper use and care of electrical meters. (1621.S.4)

Electrical Meters Objective
Students will:
1621.4.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 5: Construct and analyze basic circuits. (1621.S.5)

Basic Circuits Objectives
Students will:
1621.5.1 Describe the electrical classification of conductors, insulators, and semi-conductors.
1621.5.2 Describe electrical current and differentiate between the different kinds of current.
1621.5.3 Define voltage, current, resistance, and power.
1621.5.4 List, and schematically represent the components that make up a basic electrical circuit.
1621.5.5 Connect batteries into various series and parallel arrangements and measure and record voltage readings across each configuration.
1621.5.6 Conduct experiments that demonstrate the production of an electromotive force obtaining voltage readings from experiments.
1621.5.7 Construct, solve and troubleshoot series, parallel and complex circuits.

1621.5.8 Perform various battery tests, including: state-of-charge test, capacity (load, high-rate discharge) test, and three (3) minute charge test, and determine needed service.
1621.5.9 Inspect, clean, fill, or replace battery, battery cables, connectors and clamps.
1621.5.10 Slow and fast charge conventional and maintenance free batteries.

Standard 6: Perform basic soldering techniques. (1621.S.6)

Basic Soldering Techniques Objectives
Students will:
1621.6.1 Demonstrate proper use and care for soldering tools and equipment.
1621.6.2 Demonstrate correct stripping, tinning, and soldering procedures.
1621.6.3 Identify characteristics of a good solder connection.

Standard 7: Demonstrate skills applicable to pilot devices. (1621.S.7)

Skills Applicable to Pilot Devices Objectives
Students will:
1621.7.1 Explain purpose and uses of pilot devices.
1621.7.2 Explain and list various types of electronic and mechanical sensors and pilot devices.
1621.7.3 Install and troubleshoot various pilot devices and their circuits.

Standard 8: Demonstrate skills related to motor controls. (1621.S.8)

Skills Related to Motor Controls Objectives
Students will:
1621.8.1 Explain the difference between manual and automatic circuits.
1621.8.2 List the equipment and parts needed for automatic circuits.
1621.8.3 Identify basic motor control circuits.
1621.8.4 Connect basic AC and DC circuits for automatic and manual control.
1621.8.5 Explain and demonstrate basic troubleshooting of control circuits.
1621.8.6 Install reversing circuits.
1621.8.7 Demonstrate the use of a phase rotation meter.

Standard 9: Apply skills to relays. (1621.S.9)

Apply Skills to Relays Objectives
Students will:
1621.9.1 Describe and explain relays and relay circuits.
1621.9.2 Identify and install overload relays in control circuits.
1621.9.3 Identify and install potential-type relays in control circuits.
1621.9.4 Explain the difference between relay and magnetic starters.
1621.9.5 Explain troubleshooting techniques of relay and magnetic starters.
1621.9.6 Check various relays for faults or defects.
1621.9.7 Explain, check, and adjust various types of time delay relays.

Standard 10: Differentiate between the different types of motor braking circuits. (1621.S.10)

Motor Braking Circuits Objectives
Students will:
1621.10.1 Explain the various types of braking circuits for AC and DC motors.
1621.10.2 Describe dynamic braking circuits for AC and DC motors.

Standard 11: Troubleshoot AC and DC motors. (1621.S.11)

AC and DC Motors Objectives
Students will:
1621.11.1 Describe the various types of single-phase and three-phase AC motors and DC motors.
1621.11.2 Install, check, and troubleshoot various types of DC motors in a circuit.

Standard 12: Apply calculations to assure that NEC standards are met. (1621.S.12)

NEC Standards Objectives
Students will:
1621.12.1 Calculate conductor size and ampacity, overcurrent protection, grounding, bonding, and grounded conductor size.

Standard 13: Demonstrate automotive general electrical system diagnosis. (1621.S.13)

Automotive General Electrical System Diagnosis Objectives
Students will:
1621.13.1 Identify automotive electrical symbols.
1621.13.2 Check continuity in electrical circuits with a test light.
1621.13.3 Check applied voltages and voltage drops in electrical circuits with analog and digital voltmeters.
1621.13.4 Check current flow in electrical circuits and components with an ohmmeter.
1621.13.5 Check continuity and resistance in electrical circuits and components with analog and digital ohmmeters.
1621.13.6 Find shorts and grounds in electrical circuits.
1621.13.7 Diagnose the cause(s) of a constant battery drain.
1621.13.8 Inspect, test, and replace fusible links, circuit breakers, and fuses.

Standard 14: Perform hydraulic system diagnosis and repair. (1621.S.14)

Hydraulic System Diagnosis and Repair Objectives
Students will:
1621.14.1 Check master cylinder for internal and external leaks and proper operation, determine needed repairs.
1621.14.2 Diagnose poor stopping, pulling or dragging caused by problems in the hydraulic system, determine needed repairs.
1621.14.3 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.
1621.14.4 Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed.
1621.14.5 Inspect, test, and replace components of brake warning light system.

Standard 15: Demonstrate drum brake diagnosis and repair. (1621.S.15)

Drum Brake Diagnosis and Repair Objectives
Students will:
1621.15.1 Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation problems, determine needed repairs.
1621.15.2 Remove, clean, and inspect brake drums, shoes, springs, pins, clips, levers, adjusters/self-adjusters, and backing support plates, service, lubricate and reassemble.
1621.15.3 Pre-adjust brake shoes and parking brake before installing brake drums or drum and hub assemblies, and wheel bearings.

Standard 16: Demonstrate disc brake diagnosis and repair. (1621.S.16)

Disc Brake Diagnosis and Repair Objectives

Students will:

1621.16.1 Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation caused problems, determine needed repairs.

1621.16.2 Remove caliper assembly and brake pads from mountings; clean and inspect for leaks and damage to caliper housing. Inspect parts for wear, rust, scoring, and damage; replace seal, boot or worn parts. Clean and inspect caliper mounting and slides for wear and damage.

1621.16.3 Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace.

1621.16.4 Reinstall wheel, torque lug nuts, and make final checks and adjustments.

Standard 17: Perform diagnosis and repair of miscellaneous items. (1621.S.17)

Diagnosis and Repair of Miscellaneous Items Objectives

Students will:

1621.17.1 Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.

1621.17.2 Remove, clean, inspect, re-pack, and reinstall wheel bearings, replace seals, reinstall hub, adjust wheel bearings. Replace bearing and race as needed.

1621.17.3 Check parking brake operation, cables and components for wear, rusting, binding, corrosion and clean, lubricate and replace as needed.

1621.17.4 Check operation of brake stop light system; adjust and service as needed.

Standard 18: Perform diagnosis and adjust wheel alignment. (1621.S.18)

Diagnosis and Adjust Wheel Alignment Objectives

Students will:

1621.18.1 Check and adjust front and rear wheel camber, caster, toe, SAI (steering axis inclination) and determine needed repairs.

1621.18.2 Check rear wheel thrust angle; determine needed repairs.

1621.18.3 Check for front wheel setback; determine needed repairs.

1621.18.4 Check front cradle (sub-frame) alignment; determine needed repairs.

Standard 19: Perform diagnosis and repair of wheels and tires. (1621.S.19)

Diagnosis and Repair of Wheels and Tires Objectives

Students will:

1621.19.1 Inspect tires; check and adjust air pressure. Diagnose tire wear patterns and determine needed repairs. Rotate tires according to manufacturer's recommendations.

1621.19.2 Measure wheel, tire, axle, and hub run-out; determine needed repairs.

1621.19.3 Dismount, inspect, repair, and remount tire on wheel. Balance wheel and tire assembly (static and dynamic). Reinstall wheel; torque lug nuts.

Standard 20: Perform clutch diagnosis and repair. (1621.S.20)

Clutch Diagnosis and Repair Objectives

Students will:

1621.20.1 Diagnose clutch noise, binding, slippage, pulsation, and chatter problems; determine needed repairs.

1621.20.2 Inspect, adjust or replace clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, springs, hydraulic clutch slave and master cylinders, lines, and hoses.

1621.20.3 Inspect, adjust or replace release (throw-out) bearing, lever and pivot, crankshaft pilot bearing

or bushing (as applicable), clutch pressure plate assembly and clutch disc.

1621.20.4 Inspect, repair, and service or replace flywheel and ring gear. Measure flywheel-to-block run out and crankshaft end play; determine needed repairs.

1621.20.5 Inspect engine block, clutch (bell) housing, and transmission case mating surfaces; measure clutch (bell) housing bore-to-crankshaft run out and face squareness; determine needed repairs.

Standard 21: Troubleshoot and repair lighting systems. (1621.S.21)

Repair Lighting Systems Objectives

Students will:

1621.21.1 Diagnose brighter than normal, intermittent, dim or no light operation.

1621.21.2 Inspect, replace, and aim headlights and bulbs.

1621.21.3 Inspect and diagnose incorrect turn signal or hazard light operations; repair or replace as needed.

Standard 22: Perform diagnosis and repair of driver information systems. (1621.S.22)

Driver Information Systems Objectives

Students will:

1621.22.1 Diagnose intermittent, high, low, no gauge readings, or no readings on electronic instrument clusters, test sensors, sending units, connectors, and wires of electronic instrument circuits.

1621.22.2 Test gauge circuit voltage regulators (limiters); replace as needed.

1621.22.3 Inspect and test gauges and gauge sending units, connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.

1621.22.4 Diagnose incorrect operation of warning devices and other driver information systems.

Standard 23: Perform accessories diagnosis and repair. (1621.S.23)

Accessories Diagnosis and Repair Objectives

Students will:

1621.23.1 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; repair as needed.

1621.23.2 Diagnose incorrect operation of motor-driven accessory circuits, heated glass operation, electric door and hatch/trunk lock operation and cruise control systems.

1621.23.3 Diagnose supplemental restraint system (SRS) problems; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.)

1621.23.4 Diagnose radio static and weak, intermittent, or no radio reception.

Basic Engine Concepts

This course will introduce students to basic engine concepts, skills, technology and service of the automobile.

Standard 1: Perform general engine diagnosis, removal and reinstallations (R&R). (1623.S.1)

General Engine Diagnosis, Removal and Reinstallations (R&R) Objectives
Students will:

1623.1.1 Interpret and verify complaint; listen to engine noises; inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed repairs.
1623.1.2 Diagnose the cause of excessive oil consumption, unusual engine exhaust color, odor, and sound; determine needed repairs.
1623.1.3 Perform engine vacuum tests; determine needed repairs.
1623.1.4 Perform cylinder power balance tests; cylinder compression tests; cylinder leakage tests; determine needed repairs.
1623.1.5 Remove engine (front-wheel drive); prepare for disassembly; reinstall engine.

Standard 2: Demonstrate cylinder head and valve train diagnosis and repair. (1623..S.2)

Cylinder Head and Valve Train Diagnosis and Repair Objectives
Students will:

1623.2.1 Remove cylinder head(s); inspect cylinder head(s) for cracks; check gasket surface areas for warpage and leakage; check passage condition.
1623.2.2 Install cylinder heads and gaskets; tighten according to manufacturer's specifications and procedures.
1623.2.3 Inspect and test valve springs for squareness, pressure, and free height comparison; inspect valve spring retainers, locks, and valve grooves; replace as needed. Replace valve stem seals.
1623.2.4 Inspect valve guides for wear; check valve guide height and stem-to-guide clearance; inspect valves; inspect valve seats; recondition or replace as needed.
1623.2.5 Check valve face-to-seat contact and valve seat concentricity (run out), service seats and valves as needed.
1623.2.6 Check valve spring-assembled height and valve stem height; service valve and spring assemblies as needed.
1623.2.7 Inspect pushrods, rocker arms, rocker arm pivots and shaft for wear, bending, cracks, looseness, and blocked oil passages (orifices); repair or replace.
1623.2.8 Inspect hydraulic or mechanical lifters; replace as needed. Adjust valves (mechanical or hydraulic lifters).
1623.2.9 Inspect and replace camshaft drives (including gear wear and backlash, sprocket and chain wear, overhead cam drive sprockets, drive belts, belt tension, and tensioners).
1623.2.10 Inspect camshaft for run out, measure journals and lobes for wear.
1623.2.11 Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed repairs.
1623.2.12 Verify camshaft(s) timing according to manufacturer's specifications and procedure.

Standard 3: Perform engine block diagnosis and repair. (1623.S.3)

Engine Block Diagnosis and Repair Objectives
Students will:

1623.3.1 Inspect and replace pans, covers, gaskets, and seals.
1623.3.2 Inspect engine block for cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed repairs.

1623.3.3 Inspect internal and external threads; repair as needed.
1623.3.4 Inspect and measure cylinder walls for damage and wear; determine needed repairs. Remove cylinder wall ridges. Deglaze and clean cylinder walls.
1623.3.5 Inspect crankshaft for surface cracks and journal damage; check oil passage condition; measure journal wear; determine needed repairs.
1623.3.6 Inspect and measure main and connecting rod bearings for damage, clearance, and end play; determine needed repairs (includes the proper selections of bearings).
1623.3.7 Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; inspect rod alignment and bearing bore condition.
1623.3.8 Inspect, measure, service or replace pistons. Inspect, measure, and install piston rings.
1623.3.9 Inspect, repair or replace crankshaft vibrations damper (harmonic balancer).
1623.3.10 Inspect flywheel or flex plate and ring gear for cracks and wear; measure run out and determine needed repairs.
1623.3.11 Inspect, remove, and replace crankshaft pilot bearing or bushing (as applicable).
1623.3.12 Reassemble engine components using correct gaskets and sealants.
1623.3.13 Inspect auxiliary (balance, intermediate, idler, counterbalance or silencer) shaft(s); inspect shaft(s) and support bearings for damage and wear; determine needed repairs; reinstall and time.
1623.3.14 Prime engine lubrication system.

Standard 4: Perform lubrication and cooling systems diagnosis and repair. (1623.S.4)

Cooling Systems Diagnosis and Repair Objectives
Students will:
1623.4.1 Perform oil pressure tests; inspect oil pump ears or rotors, housing, pressure relief devices, and pump drive; replace as needed.
1623.4.2 Perform cooling system tests (pressure, combustion leakage, and temperature) determine needed repairs.
1623.4.3 Inspect, replace, and adjust drive belts and pulleys.
1623.4.4 Inspect and replace engine cooling and heater system hoses.
1623.4.5 Inspect, test, and replace thermostat and housing.
1623.4.6 Inspect coolant; drain, flush, and refill cooling system with recommended coolant and bleed air as required.
1623.4.7 Inspect, test, remove, and replace water pump.
1623.4.8 Inspect and test radiator, pressure cap, and coolant recovery system; remove and replace radiator.
1623.4.9 Clean, inspect, and test fan(s) (electrical or mechanical), inspect and test electrical fan control system and circuits, fan clutch, fan shroud and air dams.
1623.4.10 Inspect, test, and replace oil temperature and pressure switches and sensors. Inspect auxiliary oil coolers; replace as needed.
1623.4.11 Perform oil and filter change.

Brakes

This course will introduce students to the basic fundamental skills, technology, and service of automotive brake systems. Students will comply with personal and environmental safety practices associated with proper ventilation, handling, storage, and disposal of brake components.

Standard 1: Perform hydraulic system diagnosis and repair. (1625.S.1)

Hydraulic System Diagnosis and Repair Objectives
Students will:

1625.1.1 Check master cylinder for internal and external leaks and proper operation; determine needed repairs.
1625.1.2 Remove, bench bleed, and replace master cylinders.
1625.1.3 Diagnose poor stopping, pulling or dragging caused by problems in the hydraulic system; determine needed repairs.
1625.1.4 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.
1625.1.5 Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed.
1625.1.6 Select, handle, store, and install brake fluids to proper level. Bleed (manual, pressure, vacuum or surge) brake system; flush hydraulic system.
1625.1.7 Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combinations valves.
1625.1.8 Inspect, test, replace and adjust height (load) sensing proportioning valve.
1625.1.9 Inspect, test, and replace components of brake warning light system.

Standard 2: Demonstrate drum brake diagnosis and repair. (1625.S.2)

Drum Brake Diagnosis and Repair Objectives
Students will:

1625.2.1 Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation problems; determine needed repairs.
1625.2.1 Remove, clean (using proper safety procedures), inspect, and measure brake drums. Service (mount brake drum on lathe and machine) or replace as needed.
1625.2.3 Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, and backing support plates; lubricate/reassemble.
1625.2.4 Remove and reinstall wheel cylinders.
1625.2.5 Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.

Standard 3: Demonstrate disc brake diagnosis and repair. (1625.S.3)

Disc Brake Diagnosis and Repair Objectives
Students will:

1625.3.1 Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation caused problems; determine needed repairs.
1625.3.2 Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing. Inspect parts for wear, rust, scoring, and damage; replace seal, boot or worn parts. Clean and inspect caliper mounting and slides for wear and damage.
1625.3.3 Remove, clean, and inspect pads and retaining hardware; determine needed service. Reassemble, lubricate, and reinstall caliper, pads, and related hardware.
1625.3.4 Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace.

1625.3.5 Adjust calipers with integrated parking brake system. Fill master cylinder with recommended fluid and seat pads; inspect caliper for leaks.
1625.3.6 Reinstall wheel, torque lug nuts, and make final checks and adjustments.

Standard 4: Perform diagnosis and repair of power assist units. (1625.S.4)

Power Assist Units Objectives
Students will:
1625.4.1 Test pedal free travel with and without engine running; check power assist operation.
1625.4.2 Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
1625.4.3 Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; repair or replace parts as needed.

Standard 5: Perform diagnosis and repair of miscellaneous items. (1625.S.5)

Diagnosis and Repair of Miscellaneous Items Objectives
Students will:
1625.5.1 Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.
1625.5.2 Remove, clean, inspect, re-pack, and reinstall wheel bearings and replace seals; reinstall hub and adjust wheel bearings. Replace wheel bearing and race as needed.
1625.5.3 Check parking brake cables and components for wear, rusting, binding, corrosion and clean, lubricate and replace as needed.
1625.5.4 Check parking brake operation; adjust as needed. Check operation of parking brake indicator light system.
1625.5.5 Check operation of brake stop light system; adjust and service as needed.

Standard 6: Perform diagnosis and repair of an anti-lock brake system. (1625.S.6)

Anti-Lock Brake System Objectives
Students will:
1625.6.1 Inspect, test, and service anti-lock brake system (ABS) hydraulic, electrical, and mechanical components. Observe anti-lock brakes system (ABS) warning light(s) at startup; determine if further diagnosis is needed.
1625.6.2 Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise problems caused by the anti-lock brake system (ABS); determine needed repairs.
1625.6.3 Diagnose anti-lock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine needed repairs.
1625.6.4 Depressurize high pressure components of the anti-lock brake system (ABS) following manufacturer's recommended safety procedures.
1625.6.5 Fill and bleed the anti-lock brake system's (ABS) front and rear hydraulic circuits and master cylinder with recommended fluid following manufacturer's procedures; inspect system for leaks.
1625.6.6 Perform a fluid pressure (hydraulic boost) diagnosis on the high pressure anti-lock brake system (ABS); determine needed repairs.
1625.6.7 Remove and install anti-lock brake system (ABS) electrical/electronic and hydraulic components following manufacturer's procedures and specifications.
1625.6.8 Service, test, and adjust anti-lock brake system (ABS) speed sensors following manufacturer's recommended procedures
1625.6.9 Diagnose anti-lock brake system (ABS) braking problems caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).

Electrical/Electronic Systems

This course will introduce students to the skills, technology, and service of electrical/electronic systems of the automobile.

Standard 1: Demonstrate general electrical system diagnosis. (1627.S.1)

General Electrical System Diagnosis Objectives

Students will:

1627.1.1 Use wiring diagrams during diagnosis of electrical circuit problems.
1627.1.2 Check electrical circuits with a test light; determine needed repairs.
1627.1.3 Check voltage and voltage drop in electrical/electronic circuits using a digital multi meter (DMM) and current flow in electrical/electronic circuits and components using an ammeter.
1627.1.4 Check electrical circuits using jumper wires; determine needed repairs.
1627.1.5 Find shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine needed repairs.
1627.1.6 Measure and diagnose the cause(s) of abnormal key-off battery drain; repair as needed.
1627.1.7 Inspect and test fusible links, circuit breakers, and fuses; replace as needed.
1627.1.8 Inspect and test switches, connectors, relays, and wires of electrical/electronic circuits; repair or replace as needed.

Standard 2: Apply battery diagnosis and service. (1627.S.2)

Battery Diagnosis and Service Objectives

Students will:

1627.2.1 Perform battery state-of-charge test and perform slow/fast battery charge.
1627.2.2 Perform battery capacity (load, high-rate discharge) test and determine needed service.
1627.2.3 Maintain or restore electronic memory functions.
1627.2.4 Inspect, clean, fill and replace battery, clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.
1627.2.5 Start a vehicle using jumper cables and a battery or auxiliary power supply.

Standard 3: Demonstrate starting system diagnosis and repair. (1627.S.3)

Starting System Diagnosis and Repair Objectives

Students will:

1627.3.1 Perform starter current draw and circuit voltage drop test; determine needed repairs.
1627.3.2 Inspect and test starter relays and solenoids; replace as needed.
1627.3.3 Remove and replace/reinstall starter.
1627.3.4 Perform starter bench tests; determine needed repairs.
1627.3.5 Inspect, test, and repair or replace switches, connectors, and wires of starter control circuits.
1627.3.6 Disassemble, clean, inspect, and test starter components; replace as needed.

Standard 4: Perform charging system diagnosis and repair. (1627.S.4)

Charging System Diagnosis and Repair Objectives

Students will:

1627.4.1 Diagnose charging system problems that cause an undercharge, a no-charge or an overcharge condition. Perform charging circuit voltage drop tests.
1627.4.2 Inspect and adjust alternator drive belts; replace as needed.
1627.4.3 Inspect and test voltage regulator; replace as needed.
1627.4.4 Remove, inspect, and replace/reinstall alternator.
1627.4.5 Disassemble, clean, inspect, and test alternator components; replace as needed.

Standard 5: Troubleshoot lighting systems, diagnosis and repair. (1627.S.5)

Lighting Systems, Diagnosis and Repair Objectives
Students will:
1627.5.1 Diagnose brighter than normal, intermittent, dim or no light operation.
1627.5.2 Inspect, replace, and aim headlights and bulbs.
1627.5.3 Inspect and diagnose incorrect turn signal or hazard light operations; repair or replace as needed.

Standard 6: Perform diagnosis and repair of driver information systems. (1627.S.6)

Driver Information Systems Objectives
Students will:
1627.6.1 Diagnose intermittent, high, low, no gauge readings, or no readings on electronic instrument clusters, test sensors, sending units, connectors, and wires of electronic instrument circuits.
1627.6.2 Test gauge circuit voltage regulators (limiters); replace as needed.
1627.6.3 Inspect and test gauges and gauge sending units, connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.
1627.6.4 Diagnose incorrect operation of warning devices and other driver information systems.

Standard 7: Perform diagnosis and repair of horn and wiper/washer. (1627.S.7)

Horn and Wiper/Washer Objectives
Students will:
1627.7.1 Diagnose incorrect horn operation; repair as needed.
1627.7.2 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; repair as needed.
1627.7.3 Diagnose incorrect windshield washer operation; repair as needed.

Standard 8: Perform accessories diagnosis and repair. (1627.S.8)

Accessories Diagnosis and Repair Objectives
Students will:
1627.8.1 Diagnose incorrect operation of motor-driven accessory circuits, heated glass operation, electric door and hatch/trunk lock operation and cruise control systems.
1627.8.2 Diagnose supplemental restraint system (SRS) problems; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.
1627.8.3 Diagnose radio static and weak, intermittent, or no radio reception.

Engine Performance

This course will introduce students to the skills, technology, and service of electrical/electronic systems of the automobile. Students will comply with personal and environmental safety practices associated with proper ventilation and the handling, storage, and disposal of chemicals in accordance with local, state, and federal safety and environmental regulations.

Standard 1: Perform general engine diagnosis. (1629.S.1)

General Engine Diagnosis Objectives
Students will:

1629.1.1 Interpret and verify complaint, inspect engine assembly for fuel, oil, coolant, and other leaks.
1629.1.2 Diagnose unusual engine noise or vibrations problems, unusual exhaust color, odor or sound.
1629.1.3 Perform engine absolute (vacuum/boost) manifold pressure tests; determine needed repairs.
1629.1.4 Perform cylinder power balance test, cylinder compression test and cylinder leakage test.
1629.1.5 Diagnose engine mechanical, electrical, electronic, fuel, and ignition problems with an oscilloscope and engine diagnostic equipment; determine needed action.
1629.1.6 Prepare a 4 or 5 gas analyzer; inspect and prepare vehicle for test and obtain exhaust readings; interpret readings and determine needed action.

Standard 2: Perform computerized engine controls diagnosis and repair. (1629.S.2)

Computerized Engine Controls Diagnosis and Repair Objectives
Students will:

1629.2.1 Diagnose emissions or driveability problems resulting from failure of computerized engine controls with no diagnostic trouble codes stored; determine needed repairs.
1629.2.2 Retrieve and record stored diagnostic trouble codes and diagnose the causes of emissions or driveability problems resulting from failure of computerized engine controls.
1629.2.3 Inspect, test, adjust, and replace computerized engine control system sensors, powertrain control module (PCM), actuators, and circuits.
1629.2.4 Obtain and interpret digital multimeter (DMM) readings.
1629.2.5 Access and use electronic service information (ESI).
1629.2.6 Locate and interpret vehicle and major component identifications numbers, (VIN, vehicle certification labels and calibration decals).
1629.2.7 Inspect and test power and ground circuits and connections and practice recommended precautions when handling static sensitive devices.
1629.2.8 Diagnose driveability and emissions problems resulting from failures of interrelated systems (cruise control, security alarms, torque controls, suspension controls, traction controls, torque management, A/C, automatic transmissions, and similar systems); determine needed repairs.

Standard 3: Perform diagnosis and repair of ignition system. (1629.S.3)

Ignition System Objectives
Students will:

1629.3.1 Diagnose no-starting, driveability, and emissions problems on vehicles with electronic ignition (distributor-less) systems and on vehicles with distributor ignition (DI) systems.
1629.3.2 Inspect and test ignition primary circuit wiring and components, distributor, ignition system secondary circuit wiring and components and ignition coil(s).
1629.3.3 Check and adjust (where applicable) ignition system timing and timing advance/retard.
1629.3.4 Inspect and test ignition wiring harness and connectors, ignition system pick-up sensor or triggering devices and ignition control module.

Standard 4: Perform fuel, air induction, and exhaust systems diagnosis and repair. (1629.S.4)

Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair Objectives

Students will:

1629.4.1 Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems on vehicles with carburetor-type fuel systems and injection-type fuel systems.

1629.4.2 Inspect fuel tank and fuel cap, replace fuel filter, fuel lines, fittings, and hoses. Check fuel for contaminants and quality.

1629.4.3 Inspect and test mechanical and electrical fuel pumps and pump control systems; replace as needed.

1629.4.4 Inspect and test fuel pressure regulations system and components of injection-type fuel systems and test cold enrichment system components.

1629.4.5 Remove, clean, and reinstall throttle body, adjust related linkages and inspect throttle body mounting plates, air induction and filtration system, intake manifold, and gaskets.

1629.4.6 Inspect and test fuel injectors; clean and replace.

1629.4.7 Check/adjust idle speed and fuel mixture where applicable.

1629.4.8 Remove, inspect, and test vacuum and electrical components and connections of fuel system; repair or replace as needed.

1629.4.9 Inspect exhaust manifold, exhaust pipes, mufflers, resonators, tail pipes, and heat shields; repair or replace as needed.

1629.4.10 Perform exhaust system back-pressure test; determine needed action.

1629.4.11 Test the operation of turbocharger/supercharger systems, remove, clean, inspect and repair or replace turbocharger/supercharger system components and identify the causes of turbocharger/supercharger failure.

Standard 5: Demonstrate emissions control systems diagnosis and repair. (1629.S.5)

Emissions Control Systems Diagnosis and Repair Objectives

Students will:

1629.5.1 Inspect and test positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, hoses and diagnose oil leaks, emissions, and driveability problems resulting from failure of the positive crankcase ventilation (PCV) system.

1629.5.2 Diagnose emissions and driveabiliity problems cause by failure of the exhaust gas re-circulation (EGR) system, inspect and test valve, valve manifold, and exhaust passages, vacuum/pressure controls, filters, and hoses, electrical/electronic sensors, controls, and wiring.

1629.5.3 Inspect and test components of catalytic converter systems, diagnose emissions and driveability problems resulting from failure of the secondary air injection and catalytic converter systems, mechanical components of secondary air injection systems, electrical/electronically-operated components and circuits of the air injection systems.

1629.5.4 Inspect and test components of intake air temperature control system, and diagnose emissions and driveability problems resulting from failure of the intake air temperature control system.

1629.5.5 Inspect and test components of early fuel evaporation control system, and diagnose emissions and driveability problems resulting from failure of the early fuel evaporation control system.

1629.5.6 Adjust valves on engines with mechanical or hydraulic lifters.

1629.5.7 Verify correct camshaft timing; determine needed action.

1629.5.8 Verify engine operating temperature; determine needed action.

1629.5.9 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; service or replace as needed.

1629.5.10 Inspect and test thermostat, by-pass, and housing; replace as needed.

1629.5.11 Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; service or replace as needed.

Fundamentals Of Automotive Technology

This course will introduce students to the basic skills in automotive technology/ service. Students will become familiar with fundamentals of automotive technology and basic automotive electrical systems.

Standard 1: Identify, explore, and evaluate career opportunities related to automotive technology. (1631.S.1)

Career Opportunities Related to Automotive Technology Objectives
Students will:
1631.1.1 Describe a variety of careers related to automotive technology, and the training necessary to be successful in those careers.
1631.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of automotive technology.
1631.1.3 Identify sources of information about careers in automotive technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to automotive technology. (1631.S.2)

Automotive Technology Objectives
Students will:
1631.2.1 Recognize and follow general shop safety guidelines.
1631.2.2 Select and wear appropriate protective equipment.
1631.2.3 Demonstrate the proper selection and use of fire extinguishers.
1631.2.4 Identify and demonstrate proper use and care of all basic personal safety equipment.
1631.2.5 Describe safety precautions necessary when using hazardous materials.
1631.2.6 Explain the OSHA "Right to Know" law.
1631.2.7 Conduct safety inspections in the lab.

Standard 3: Identify basic hand and power tools and demonstrate safe and appropriate use. (1631.S.3)

Basic Hand and Power Tools Objectives
Students will:
1631.3.1 Choose the proper hand tools for given applications, and describe the proper care and maintenance of each.
1631.3.2 Demonstrate any adjustments possible with each tool.
1631.3.3 Choose proper power tools for given application, and demonstrate proper care and maintenance of each.
1631.3.4 Make necessary adjustments to power tools.
1631.3.5 Recognize and identify appropriate blade or bit for given situation, and demonstrate the ability to change blades and bits on cutting tools.

Standard 4: Demonstrate a working knowledge of general electrical system diagnosis. (1631.S.4)

General Electrical System Diagnosis Objectives
Students will:
1631.4.1 Identify automotive electrical symbols.
1631.4.2 Check continuity in electrical circuits with a test light.
1631.4.3 Check applied voltages and voltage drops in electrical circuits with analog and digital voltmeters.
1631.4.4 Check current flow in electrical circuits and components with an ohmmeter.

1631.4.5 Check continuity and resistance in electrical circuits and components with analog and digital ohmmeters.
1631.4.6 Find shorts and grounds in electrical circuits.
1631.4.7 Diagnose the cause(s) of a constant battery drain.
1631.4.8 Inspect, test, and replace fusible links, circuit breakers, and fuses.

Standard 5: Demonstrate battery diagnosis and service. (1631.S.5)

Battery Diagnosis and Service Objectives
Students will:
1631.5.1 Perform various battery tests, including: state-of-charge test, capacity (load, high-rate discharge) test, and three (3) minute charge test, and determine needed service.
1631.5.2 Inspect, clean, fill, or replace battery, battery cables, connectors and clamps.
1631.5.3 Slow and fast charge conventional and maintenance free batteries.
1631.5.4 Jump start a vehicle with jumper cables and a booster battery or auxiliary power supply.

Standard 6: Demonstrate starting system diagnosis and repair procedures. (1631.S.6)

Starting System Diagnosis and Repair Procedures Objectives
Students will:
1631.6.1 Perform starter current draw test and starter circuit voltage drop test: determine needed repairs.
1631.6.2 Inspect, test, and repair or replace switches, connectors, and wires of starter control circuits.
1631.6.3 Inspect, test, and replace starter relays and solenoids.
1631.6.4 Remove and replace starter.
1631.6.5 Disassemble and clean starter components, inspect and replace starter drive, inspect and replace starter brushes and brush holders, inspect and replace starter bushings and end frames, inspect and test starter field coils and inspect, test, and replace starter armature.
1631.6.6 Perform starter free-running (bench) tests; determine needed repairs.

Standard 7: Identify and repair charging system components. (1631.S.7)

Charging System Components Objectives
Students will:
1631.7.1 Diagnose charging system problems that cause an overcharge, undercharge or a no-charge condition.
1631.7.2 Inspect, adjust, and replace alternator drive belts, pulleys, and fans.
1631.7.3 Perform charging system output test; determine needed repairs.
1631.7.4 Perform alternator output test; determine needed repairs.
1631.7.5 Remove and replace regulator.

Heating and Air Conditioning

This course will introduce students to the heating and air conditioning systems of the automobile. Students will comply with personal and environmental safety practices associated with the handling, storage, and disposal of chemicals in accordance with local, state, and federal safety regulations.

Standard 1: Perform diagnosis and repair of A/C system. (1633.S.1)

Perform Diagnosis and Repair of A/C System Objectives
Students will:

1633.1.1 Diagnose unusual operating noises in the A/C system; determine needed repairs.
1633.1.2 Conduct performance test of the A/C system; determine needed repairs.
1633.1.3 Leak test A/C system; determine needed repairs.
1633.1.4 Inspect the condition of discharged oil. Select oil type; measure and add oil to the A/C system as needed.

Standard 2: Perform refrigeration system component diagnosis and repair. (1633.S.2)

Refrigeration System Component Diagnosis and Repair Objectives
Students will:

1633.2.1 Diagnose A/C system problems that cause the protection devices (pressure, thermal, and PCM) to interrupt system operations; determine needed repairs.
1633.2.2 Inspect A/C compressor drive belts; replace and adjust as needed.
1633.2.3 Inspect, test, and replace A/C compressor clutch components or assembly.
1633.2.4 Remove and replace A/C compressor and mountings.
1633.2.5 Inspect and replace A/C compressor shaft seal assembly.
1633.2.6 Diagnose A/C system problems caused by too much moisture in the refrigerant; determine needed repairs.
1633.2.7 Install A/C system filter. Remove and inspect A/C system mufflers, hoses, lines, fittings, 0-rings, seals, and service valves; replace as needed.
1633.2.8 Inspect A/C condenser for air flow restrictions; service as required.
1633.2.9 Inspect receiver/drier or accumulator/drier; service as needed.
1633.2.10 Inspect and test expansion valve or orifice (expansion) tube; replace as needed.
1633.2.11 Inspect evaporator housing water drain; repair as needed.

Standard 3: Perform diagnosis and repair of heating and engine cooling systems. (1633.S.3)

Heating and Engine Cooling Systems Objectives
Students will:

1633.3.1 Diagnose temperature control problems in the heater/ventilation system; determine needed repairs.
1633.3.2 Perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature); determine needed repairs.
1633.3.3 Inspect engine cooling and heater system hoses and belts; replace as needed.
1633.3.4 Inspect, test, and replace thermostat and housing.
1633.3.5 Determine coolant condition; drain and recover. Flush system and refill with recommended coolant; bleed system.
1633.3.6 Clean, inspect and test fan, fan clutch (electrical and mechanical), fan shroud, and air dams; replaces as needed.
1633.3.7 Inspect and test heater control valve(s); replace as needed.

Standard 4: Perform operating systems and related controls diagnosis and repair. (1633.S.4)

Operating Systems and Related Controls Diagnosis and Repair Objectives
Students will:

1633.4.1 Diagnose failures in the electrical controls of heating and A/C systems; determine needed repairs.
1633.4.2 Inspect and test A/C - heater blower, motors, resistors, switches, relays, wiring, and protection devices; repair or replace as needed.
1633.4.3 Test A/C compressor load cut-off systems; determine needed repairs.
1633.4.4 Diagnose failures in the vacuum and mechanical controls of the heating and A/C system; determine needed repairs.
1633.4.5 Inspect and test A/C -heater control panel assembly; inspect and test A/C-heater control cables and linkages; replace as needed.
1633.4.6 Inspect and test A/C-heater vacuum control switches, hoses, diaphragms (motors), vacuum reservoir, check valve, and restrictors; replace as needed.
1633.4.7 Check operation of automatic and semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine needed repairs.

Standard 5: Perform refrigerant recovery, recycling and handling. (1633.S.5)

Refrigerant Recovery, Recycling and Handling Objectives
Students will:

1633.5.1 Verify correct operation and maintenance of refrigerant handling equipment. Identify and recover A/C system refrigerant.
1633.5.2 Recycle, label and store refrigerant.
1633.5.3 Test recycled refrigerant for non-condensable gases.
1633.5.4 Evacuate and charge A/C system.

Manual/Automatic Drive Train Axles

This course will introduce students to the manual/automatic drive train and axle systems of the automobile.

Standard 1: Apply clutch diagnosis and repair. (1635.S.1)

Clutch Diagnosis and Repair Objectives
Students will:

1635.1.1 Diagnose clutch noise, binding, slippage, pulsation, and chatter problems; determine needed repairs.

1635.1.2 Inspect, adjust or replace clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, springs, hydraulic clutch slave and master cylinders, lines, and hoses.

1635.1.3 Inspect, adjust or replace release (throw-out) bearing, lever and pivot, crankshaft pilot bearing or bushing (as applicable), clutch pressure plate assembly and clutch disc.

1635.1.4 Inspect, repair, and service or replace flywheel and ring gear. Measure flywheel-to-block runout and crankshaft end play; determine needed repairs.

1635.1.5 Inspect engine block, clutch (bell) housing, and transmission case mating surfaces; measure clutch (bell) housing bore-to-crankshaft runout and face squareness; determine needed repairs.

Standard 2: Demonstrate manual transmission diagnosis and repair. (1635.S.2)

Manual Transmission Diagnosis and Repair Objectives
Students will:

1635.2.1 Diagnose transmission noise, hard shifting, jumping out of gear, and fluid leakage problems; determine needed repairs.

1635.2.2 Inspect, adjust, and replace transmission shift linkages, brackets, bushings, cables, pivots, and levers. Inspect, replace, and align power train mounts.

1635.2.3 Inspect and replace transmission gaskets, seals, and sealants; inspect sealing surfaces.

1635.2.4 Remove, disassemble, clean, reassemble transmission components and reinstall transmission.

1635.2.5 Inspect, adjust, and reinstall transmission shift cover, forks, grommets, levers, shafts, sleeves, detent mechanisms, interlocks, and springs. Inspect lubrication devices (oil pump or slingers).

1635.2.6 Inspect and replace speedometer drive gear, driven gear, vehicle speed sensor (VSS) and retainers.

1635.2.7 Inspect, repair, and replace extension housing and transmission case mating surfaces, bores, bushings, and vents.

Standard 3: Perform transaxle diagnosis and repair. (1635.S.3)

Transaxle Diagnosis and Repair Objectives
Students will:

1635.3.1 Diagnose transaxle noise, hard shifting, jumping out of gear, and fluid leakage problems; determine needed repairs.

1635.3.2 Inspect, adjust, and reinstall transaxle shift linkages, brackets, bushings, cables, pivots, and levers. Inspect and reinstall power train mounts.

1635.3.3 Inspect and replace transaxle gaskets, seals, and sealants; inspect sealing surfaces.

1635.3.4 Remove and reinstall transaxle and replace final drive.

1635.3.5 Inspect, adjust and reinstall transaxle shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks and springs, input (clutch) shaft and bearings, output shaft,

gears, thrust washers, bearings, and retainers.

1635.3.6 Measure end play or preload (shim or spacer selection procedure) on transaxle shafts; adjust as needed.

1635.3.7 Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings, reverse idler gear, shaft, bearings, thrust washers, and retainers.

1635.3.8 Inspect transaxle case, mating surfaces, bores, bushings, and vents.

1635.3.9 Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers, inspect, measure, adjust, and reinstall differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. Inspect lubrication devices (oil pump or slingers).

1635.3.10 Diagnose differential assembly noise and vibration problems; determine needed repairs.

Standard 4: Perform diagnosis and repair of universal and constant-velocity (CV) joint. (1635.S.4)

Universal and Constant-Velocity (CV) Joint Objectives

Students will:

1635.4.1 Diagnose constant-velocity (CV) joint/ universal joint noise and vibrations problems; determine needed repairs.

1635.4.2 Diagnose front wheel drive (FWD) front wheel bearing noise and vibration problems.

1635.4.3 Inspect, service, and replace shafts, yokes, boots, and shaft center support bearings.

1635.4.4 Check and correct shaft balance; measure shaft runout; measure and adjust driveline angles.

Standard 5: Perform ring and pinion gears and differential case assembly. (1635.S.5)

Ring and Pinion Gears and Differential Case Assembly Objectives

Students will:

1635.5.1 Diagnose ring and pinion gears noise and vibrations and fluid leakage problems.

1635.5.2 Inspect and replace companion flange and pinion seal; measure companion flange runout.

1635.5.3 Inspect ring gear, pinion gear, spacers, sleeves, and bearings and measure runout. Measure and adjust drive pinion depth, pinion bearing preload, side bearing preload and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup and shim types).

1635.5.4 Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case. Check ring and pinion tooth contact patterns; adjust as needed.

1635.5.5 Reassemble and reinstall differential case assembly; measure runout; make needed adjustments.

Standard 6: Demonstrate limited slip differential, diagnosis and repair. (1635.S.6)

Limited Slip Differential, Diagnosis and Repair Objectives

Students will:

1635.6.1 Diagnose noise, slippage, and chatter problems; determine needed repairs.

1635.6.2 Inspect and flush differential housing; refill with correct lubricant.

1635.6.3 Inspect and reinstall clutch (cone or plate) components.

1635.6.4 Measure rotating torque; determine needed repairs.

Standard 7: Perform diagnosis and repair of axle shafts. (1635.S.7)

Perform Diagnosis and Repair of Axle Shafts Objectives

Students will:

1635.7.1 Diagnose rear axle shafts, bearings, and seals for noise, vibration, and fluid leakage problems; determine needed repairs.

1635.7.2 Remove and replace rear axle shafts. Inspect and replace rear axle shaft wheel studs.

1635.7.3 Inspect, measure rear axle flange runout and shaft end play and replace rear axle shaft seals, bearings, and retainers.

Standard 8: Perform four-wheel drive/all wheel drive component diagnosis and repair. (1635.S.8)

Four-Wheel Drive/All Wheel Drive Component Diagnosis and Repair Objectives
Students will:
1635.8.1 Diagnose noise, vibration, and unusual steering problems; determine needed repairs.
1635.8.2 Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.
1635.8.3 Remove, disassemble, service, and reassemble transfer case and components and reinstall transfer case.
1635.8.4 Inspect, service, and replace front-wheel bearings and locking hubs.
1635.8.5 Inspect viscous coupling assembly. Check drive assembly seals and vents; check lube level.

Standard 9: Demonstrate automatic transmission/transaxle diagnosis, maintenance and adjustment. (1635.S.9)

Automatic Transmission/Transaxle Diagnosis, Maintenance and Adjustment Objectives
Students will:
1635.9.1 Interpret and verify drivers complaint, diagnose noise and vibrations problems, verify proper engine operation, diagnose unusual fluid usage, level, and condition problems.
1635.9.2 Perform stall tests, perform lock-up converter system tests and determine needed repairs.
1635.9.3 Diagnose electronic, mechanical, and vacuum control systems; determine needed repairs.
1635.9.4 Inspect, adjust, or replace manual shift valve and throttle (TV) linkages or cables and check gear select indicator (as applicable).
1635.9.5 Inspect, repair, and replace governor assembly.
1635.9.6 Inspect, measure, clean, and replace valve body (includes surfaces and bores, springs, valves, sleeves, retainers, brackets, check-ball, screens, spacers, and gaskets); check/adjust valve body bolt torque.
1635.9.7 Inspect servo bore, piston, seals, pin, spring, and retainers; repair or replace as needed.
1635.9.8 Inspect accumulator bore, piston, seals, spring, and retainer; repair or replace as needed.
1635.9.9 Inspect, test, adjust, repair or replace transmission related electrical and electronic components (includes computers, solenoids, sensors, relays, switches, and harnesses).
1635.9.10 Inspect, replace, align power train mounts.
1635.9.11 Inspect and replace parking brake shaft, spring, and retainer.
1635.9.12 Remove and reinstall transmission and torque converter (rear-wheel drive).
1635.9.13 Remove and reinstall transaxle and torque converter assembly.
1635.9.14 Disassemble, clean, and inspect and reassemble transmission/transaxle.

Standard 10: Perform oil pump and converter diagnosis and repair. (1635.S.10)

Oil Pump and Converter Diagnosis and Repair Objectives
Students will:
1635.10.1 Inspect converter flex plate, attaching parts, pilot and pump drive, and seal areas.
1635.10.2 Measure torque converter end play and check for interference; check stator clutch.
1635.10.3 Inspect, measure, and replace oil pump housings, shafts, vanes, rotors, gears, valves, seals, and bushings.
1635.10.4 Check torque converter and transmission cooling system for contamination.

Standard 11: Inspect and repair gear train, shafts, bushings and case. (1635.S.11)

Gear Train, Shafts, Bushings and Case Objectives
Students will:

1635.11.1 Check end play or preload, inspect, measure, and replace thrust washers and bearings.
1635.11.2 Inspect bushings, oil delivery seal rings, ring grooves, and sealing surface areas; replace as needed.
1635.11.3 Inspect and measure planetary gear assembly (includes sun, ring gear, thrust washers, planetary gears, and carrier assembly); replace as needed.
1635.11.4 Inspect cases, bores, passages, bushings, vents, and mating surfaces; replace as needed.
1635.11.5 Inspect, measure, repair, adjust or replace transaxle final drive components.
1635.11.6 Inspect and reinstall parking pawl, shaft, spring, and retainer; replace as needed.

Standard 12: Perform diagnosis and repair of friction and reaction units. (1635.S.12)

Friction and Reaction Units Objectives
Students will:
1635.12.1 Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates, clutch pack clearance, and inspect bands and drums; replace as needed.
1635.12.2 Air test operation of clutch and servo assemblies.
1635.12.3 Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; replace as needed.

Suspension and Steering Diagnosis

This course will introduce students to the basic fundamental skills, technology, and service of automotive suspension and steering systems.

Standard 1: Perform steering systems diagnosis and repair. (1637.S.1)

Steering Systems Diagnosis and Repair Objectives

Students will:

1637.1.1 Disable supplemental restraint system (SRS) in accordance with manufacturer's procedures.

1637.1.2 Diagnose steering column noises, looseness, and binding problems (including tilt mechanisms); determine needed repairs.

1637.1.3 Diagnose power rack and pinion and non-rack and pinion steering gear binding, uneven turning effort, looseness, hard steering, steering gear vibration, and fluid leakage problems: determine needed repairs.

1637.1.4 Inspect and replace steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel.

1637.1.5 Adjust manual or power non-rack and pinion worm gear bearing pre-load and sector lash.

1637.1.6 Remove and replace manual or power rack and pinion steering gear; inspect mounting bushings and brackets.

1637.1.7 Disassemble, inspect, repair, and reassemble rack and pinion steering gear.

1637.1.8 Adjust manual or power rack and pinion steering gear.

1637.1.9 Inspect and replace manual or power rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.

1637.1.10 Inspect manual and power steering fluid levels and condition. Flush, fill, and bleed power steering system. Inspect, replace, and adjust power steering pump belt.

1637.1.11 Diagnose power steering fluid leakage; determine needed repairs.

1637.1.12 Remove, inspect, and replace power steering pump, pump mounts, pump seals, and gaskets. Remove, inspect, and replace power steering pump pulley and check alignment.

1637.1.13 Perform power steering system pressure test; determine needed repairs. Inspect and replace power steering hoses and fittings.

1637.1.14 Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper. Inspect, replace, and adjust tie ends (sockets), tie rod sleeves, and clamps.

1637.1.15 Diagnose, inspect, adjust, repair or replace components of electronically-controlled steering systems.

1637.1.16 Diagnose, inspect, repair or replace components of variable-assist steering systems.

Standard 2: Perform diagnosis and repair of front suspensions. (1637.S.2)

Diagnosis and Repair of Front Suspensions Objectives

Students will:

1637.2.1 Diagnose short and long arm suspension system noises, body sway, and uneven riding height problems; determine needed repairs.

1637.2.2 Diagnose MacPherson strut suspension system noises, body sway, and uneven riding height problems; determine needed repairs. Remove, inspect, and replace ball joints on strut suspension systems.

1637.2.3 Remove, inspect, and replace MacPherson strut cartridge or assembly, strut coil spring, insulators, and upper strut bearing mount.

1637.2.4 Remove, inspect, replace upper and lower control arms, bushings, shafts, and rebound bumpers. Remove, inspect, and replace steering knuckle assemblies.

1637.2.5 Remove, inspect, replace and adjust strut (compression/tension) rods and bushings.

1637.2.6 Remove, inspect, and replace upper and lower ball joints on short and long arm suspension

systems.

1637.2.7 Remove, inspect, and replace short and long arm suspension system coil springs and spring insulators.

1637.2.8 Remove, inspect, replace, and adjust suspension system torsion bars; inspect mounts.

1637.2.9 Remove, inspect, and replace stabilizer bar bushings, brackets, and links.

1637.2.10 Lubricate suspension and steering systems.

Standard 3: Perform diagnosis and repair of rear suspensions. (1637.S.3)

Rear Suspensions Objectives

Students will:

1637.3.1 Remove, inspect, and replace coil springs and spring insulators.

1637.3.2 Remove, inspect and replace transverse links, control arms, bushings, and mounts.

1637.3.3 Remove, inspect, and replace leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.

1637.3.4 Remove, inspect, and replace MacPherson strut cartridge or assembly, strut coil spring, and insulators (silencers).

Standard 4: Demonstrate miscellaneous services. (1637.S.4)

Miscellaneous Services Objectives

Students will:

1637.4.1 Inspect, remove, and replace shock absorbers.

1637.4.2 Remove, inspect, and service or replace front and rear wheel bearings.

1637.4.3 Diagnose, inspect, adjust, repair or replace components of electronically-controlled suspension systems.

Standard 5: Perform diagnosis and adjust wheel alignment. (1637.S.5)

Wheel Alignment Objectives

Students will:

1637.5.1 Diagnose vehicle wander, drift, pull, hard steering, bump steer, ride height, memory steer, torque steer, and steering return problems; determine needed repairs.

1637.5.2 Check and adjust front and rear wheel camber, caster, toe, SAI (steering axis inclination) and determine needed repairs.

1637.5.3 Center steering wheel.

1637.5.4 Check rear wheel thrust angle; determine needed repairs.

1637.5.5 Check for front wheel setback; determine needed repairs.

1637.5.6 Check front cradle (sub-frame) alignment; determine needed repairs.

Standard 6: Perform diagnosis and repair of wheels and tires. (1637.S.6)

Wheels and Tires Objectives

Students will:

1637.6.1 Inspect tires; check and adjust air pressure. Diagnose tire wear patters and determine needed repairs. Rotate tires according to manufacturer's recommendations.

1637.6.2 Diagnose wheel/tire vibrations, shimmy, and noise problems; determine needed repairs.

1637.6.3 Measure wheel, tire, axle, and hub run-out; determine needed repairs.

1637.6.4 Diagnose tire pull (lead) problem; determine corrective actions.

1637.6.5 Dismount, inspect, repair, and remount tire on wheel. Balance wheel and tire assembly (static and dynamic). Reinstall wheel; torque lug nuts.

Cabling-Video/Data/Voice

This course will introduce students to the fundamentals of telecommunications, cabling installation, standards, codes, plans and specifications.

Standard 1: Demonstrate knowledge of cabling installation overview. (1641.S.1)

Cabling Installation Overview Objectives
Students will:
1641.1.1 Describe the history and future directions of the cabling industry.
1641.1.2 Describe the knowledge and skills covered in the training.
1641.1.3 Register for the required examinations for the training.

Standard 2: Describe general information related to cabling. (1641.S.2)

Cabling Objectives
Students will:
1641.1.1 Identify structured premise cabling system characteristics.
1641.1.2 Specify standards and codes.
1641.1.3 Read plans and specifications.
1641.1.4 Understand various cabling media.
1641.1.5 Use various types of connectors.
1641.1.6 Apply transmission fundamentals.
1641.1.7 Properly do grounding and bonding.
1641.1.8 Use the accepted safety standards and procedures.
1641.1.9 Work as a professional in the cabling industry.

Standard 3: Utilize the proper cable installation practices. (1641.S.3)

Cable Installation Practices Objectives
Students will:
1641.1.1 Apply pre-cabling preparation practices.
1641.1.2 Perform cable pulling operations.
1641.1.3 Install the necessary firestopping systems.
1641.1.4 Apply cable termination functions.
1641.1.5 Perform cable splicing procedures.
1641.1.6 Properly perform cable testing procedures.
1641.1.7 Be able to troubleshoot cable problems.
1641.1.8 Perform retrofitting procedures.
1641.1.9 Perform administrative tasks associated with cabling practices.

Fundamentals of UNIX

WVEIS Code 1643

Content Standards for this course are under development.

Networking Fundamentals

This is the first of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. Instruction and training are provided in the proper care, maintenance, and use of networking software, tools, and equipment. Students will also be made aware of safety, building and environmental codes and regulations.

Standard 1: Demonstrate the proper care, maintenance and use of networking software, tools and equipment. (1645.S.1)

Networking Software, Tools and Equipment Objectives

Students will:

1645.1.1 Apply safety rules, regulations, and procedures.
1645.1.2 Utilize decision-making techniques and employ higher-level thinking skills.
1645.1.3 Demonstrate an understanding of the OSI model and its seven layers.
1645.1.4 Demonstrate an understanding of IP addressing schemes.
1645.1.5 Define and demonstrate an understanding of the concept of routers.
1645.1.6 Display an understanding of the application of the binary number system.
1645.1.7 Understand the use of ARP/RARP with routers.
1645.1.8 Discuss the problems and capabilities with various types of media.
1645.1.9 Identify and describe the appropriate IEEE standards for Ethernet and Token Ring
1645.1.10 Design a LAN in the lab setting.
1645.1.11 Describe the design of three types of topologies.
1645.1.12 Make a connection between network media and telecommunications outlets.
1645.1.13 Successfully string cable using approved methods.
1645.1.14 Properly use a cable stretcher for selected tests on the wire.
1645.1.15 Apply EIA/TIA standards to MDF's and IDF's.
1645.1.16 Define and select solutions for: surge, spike, sag, oscillation and ground loop.
1645.1.17 Apply SCAN skills to the workplace.

Project Based Networking

This is the fourth of four courses designed to introduce new content and extend previously learned networking skills. Project Based Networking introduces Wide Area Networks (WAN's), Integrated Services Data Networks (ISDN), Point-to-Point Protocols (PPP) and Frame Relay design, configuration, and maintenance. The culmination of the course is the Threaded Case Study, in which the student designs a WAN utilizing all the knowledge gained in the previous Cisco Courses.

Standard 1: Demonstrate the ability to use Wide Area Networks, Integrated Services Data Networks, Point-to-Point Protocols and Frame Relay design, configuration and maintenance. (1647.S.1)

Wide Area Networks, Integrated Services Data Networks, Point-to-Point Protocols and Frame Relay Design, Configuration and Maintenance Objectives

The student will:

1647.1.1 Understand the basics of WAN technologies.
1647.1.2 Study WAN encapsulation formats, protocols, HDLC, PPP.
1647.1.3 Become aware of the process for gathering data to implement a WAN.
1647.1.4 Describe the placement of Integrated Services Data Network and Frame Relay
1647.1.5 Describe PPP's connection negotiation process
1647.1.6 Understand the use of Link Control Protocol and Network Control Protocol.
1647.1.7 Configure and verify a PPP connection.
1647.1.8 Be able to explain why ISDN is used.
1647.1.9 Apply the standards of ISDN.
1647.1.10 Configure an ISDN connection.
1647.1.11 Understand the services and standards of Frame Relay.
1647.1.12 Understand the functions of DLCI in Frame Relay.
1647.1.13 Explain how Frame Relay solves the problem of split horizon.
1647.1.14 Configure Frame Relay.
1647.1.15 Utilize knowledge gained in the Threaded Case Study.

Routing and Switching

This is the third of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. In this course students will learn about switches, Local Area Networks (LAN's), and Virtual Local Area Networks (VLAN's) design, configuration and maintenance.

Standard 1: Demonstrate knowledge, design, configuration and maintenance of switches, Local Area Networks and Virtual Local Area Networks. (1649.S.1)

Local Area Networks and Virtual Local Area Networks Objectives
Students will:

1649.1.1 Explain The Concept Of Congestion In Switched Ethernet LAN's.
1649.1.2 Design A Plan That Improves LAN Performance Through The Use Of Switches.
1649.1.3 Differentiate Between Symmetric And Asymmetric Switching.
1649.1.4 Define And Explain The Functions Of A VLAN.
1649.1.5 Setup A VLAN By Configuring The Switch.
1649.1.6 Explain The Operation Of VLAN Network Security.
1649.1.7 List And Summarize The IEEE 802 VLAN Standards.
1649.1.8 Define The LAN Design Goals.
1649.1.9 Design A LAN And Justify The Decisions Made On Selected Criteria.
1649.1.10 Demonstrate IGRP Configuration Tasks.
1649.1.11 Compare And Contrast Routing Versus Routed Protocols.
1649.1.12 Compare: Distance Vector, Hybrid, And Link State Routing Protocols.
1649.1.13 Differentiate Between Static Routes, Default Routes And Dynamic Routes.
1649.1.14 Describe The Purpose Of Standard Access Lists And Extended Access Lists.
1649.1.15 Create A List Of Deny/Permit Test.
1649.1.16 Create An IP Access List Using: Wildcard Mask Bits, Wildcard Any & Host.
1649.1.17 Discuss The Difference Between Novell IPX And Other Networks.
1649.1.18 Configure A Novell Network Using Novell IPX Addresses.

Routing Theory and Router Technologies

This is the second of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. This course will focus on the role of the router in networks. Students will study routing protocols, router configuration and various router commands.

Standard 1: Perform routing protocols, router configuration and various router commands. (1651.S1)

Routing Protocols, Router Configuration and Various Router Commands Objectives
Students will:

1651.1.1 Identify the functions of the TCP/IP transport-layer Protocols.
1651.1.2 Manage the configuration files from the privileged exec mode on a router.
1651.1.3 Identify the functions performed by ICMP.
1651.1.4 Control router passwords, identification and enable banners.
1651.1.5 Identify the main Cisco IOS software commands for router startup.
1651.1.6 Check an initial configuration using the setup command.
1651.1.7 Log into a router in both user and privileged modes.
1651.1.8 Be able to use the context-sensitive help facility on the router.
1651.1.9 Use command history and editing features.
1651.1.10 List the commands to load Cisco IOS software from flash memory or ROM.
1651.1.11 Prepare to load, upgrade and load a Cisco IOS software image.
1651.1.12 Identify the parts in a specific protocol address.
1651.1.13 Become aware of problems encountered with topology changes.
1651.1.14 Configure IP addresses and subnet masks.
1651.1.15 Prepare the initial configuration for a router and enable IP.
1651.1.16 Add the RIP routing protocol to the router configuration.
1651.1.17 Add the IGRP routing protocol to the router
1651.1.18 Configure standard access lists to filter IP traffic.
1651.1.19 Configure extended access lists to filter IP traffic.

Web Course Design

This course will teach students to use the web design elements of a professional web page software package as well as various software programs that support that package.

Standard 1: Use the CISCO fundamentals of web design. (1653.S.1)

CISCO Fundamentals of Web Design Objectives
Students will:

1653.1.1 Demonstrate an understanding of the basic design principles for a web page.
1653.1.2 Demonstrate an understanding of file formats related to creating web pages.
1653.1.3 Create basic HTML code using a text editor.
1653.1.4 Create a personal web page in HTML code using a text editor.
1653.1.5 Use an HTML editor to create and edit HTML code.
1653.1.6 Create and edit images for web pages using digital cameras and various photography and graphic software programs.
1653.1.7 Optimize images for the web.
1653.1.8 Create vector and bitmap graphics.
1653.1.9 Create .SWF and .GIF animations.
1653.1.10 Create animations with DHTML.
1653.1.11 Create navigational elements.
1653.1.12 Edit and optimize video for web delivery.
1653.1.13 Create web pages with interactive elements.
1653.1.14 Demonstrate the use of accessibility.
1653.1.15 Demonstrate the use of usability.
1653.1.16 Create and use tables, hyperlinks, and frames.
1653.1.17 Create and use Cascading Style Sheets.
1653.1.18 Demonstrate site management skills.
1653.1.19 Create a website for the course project.

Standard 2: Use ethics in web page design. (1653.S.2)

Web Page Design Objective
Students will:

1653.2.1 Practice ethic behavior when developing and using web pages and the Internet.

Blueprint Reading

This course will introduce students to basic blueprint reading fundamentals, including symbols, orthographic projections, isometric and sketching techniques, dimensioning, title blocks and common practices.

Standard 1: Determine requirements from construction drawings and floor plans, draw office and field sketches and identify and interpret basic civil, mapping and architecture symbols. (1661.S.1)

Construction Drawings and Floor Plans Objectives

Students will:

1661.1.1 Identify alphabet of lines and mapping symbols.
1661.1.2 Describe location of six (6) most commonly used views with orthographic projections.
1661.1.3 Demonstrate isometric and plane view sketching techniques.
1661.1.4 Complete statements concerning methods of dimensioning.
1661.1.5 Differentiate between notes and specifications.
1661.1.6 Analyze information from plan views and title blocks.
1661.1.7 Explain function and use of typical drawings.
1661.1.8 Read a drawing and write a bill of materials.
1661.1.9 Draw working sketches using field notes, dimensions and specifications.
1661.1.10 Identify drawing symbols and draw samples of each.
1661.1.11 Describe common blueprint abbreviations.
1661.1.12 Interpret abbreviations for common construction practices.
1661.1.13 Use print machine to make working copies of original drawings.

Fundamentals of Collision Repair Technology

This course will introduce students to the basic fundamentals of Collision Repair Technology. Students will become familiar with tools and materials for basic analysis and damage repair; general occupational information and computer applications.

Standard 1: Identify, explore, and evaluate career opportunities related to automotive technology. (1671.S.1)

Automotive Technology Objectives
Students will:

1671.1.1 Describe a variety of careers related to automotive technology, and the training necessary to be successful in those careers.
1671.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of automotive technology.
1671.1.3 Identify sources of information about careers in automotive technology.

Standard 2: Demonstrate knowledge of basic safety rules, equipment and hazardous waste disposal as it relates to collision repair technology. (1671.S.2)

Collision Repair Technology Objectives
Students will:

1671.2.1 Recognize and follow general collision repair lab safety guidelines, including the wearing of appropriate protective equipment.
1671.2.2 Demonstrate the proper selection and use of fire extinguishers.
1671.2.3 Identify personal health and safety hazards according to OSHA guidelines.
1671.2.4 Identify and properly dispose of hazardous waste according to EPA regulations.
1671.2.5 Inspect air makeup and exhaust systems to insure proper filtering and ventilation. (intake filters, exhaust filters, fan, and other mechanical components of the system).
1671.2.6 Select spray mask and inspect to insure proper fit and operation; inspect condition of the mask filters and other components.

Standard 3: Analyze damage and prepare a vehicle for repairs. (1671.S.3)

Vehicle Repair Objectives
Students will:

1671.3.1 Review damage report, and analyze damage to determine appropriate methods for overall repair.
1671.3.2 Remove damaged or necessary inside and outside trim and moldings.
1671.3.3 Remove damaged, non-structural body panels and components that may interfere with or be damaged during repair.
1671.3.4 Remove all vehicles mechanical and electrical components that may interfere with or be damaged during repair; replace after repair.
1671.3.5 Protect panels and parts adjacent to repair area to prevent damage.
1671.3.6 Remove dirt, grease, and wax from those areas to be repaired.
1671.3.7 Remove dirt, corrosion protection, under coatings, sealers, and other protective coatings necessary to perform repairs to structural areas.
1671.3.8 Remove repairable plastics and other parts that are recommended for off-car repair.

Standard 4: Metal finish a damaged panel to its original form. (1671.S.4)

Metal Finish Objectives
Students will:

1671.4.1 Grind the paint from the damaged area of body panel.
1671.4.2 Pick and file the damaged area of a body panel to eliminate surface irregularities.
1671.4.3 Disc sand the repaired body panel to produce final smoothness.

Standard 5: Mix and apply body fillers. (1671.S.5)

Body Filler Objectives
Students will:
1671.5.1 Mix and apply plastic body filler and cheese-grate during curing.
1671.5.2 Rough sand cured plastic body filler to contour; finish sand.
1671.5.3 Featheredge repaired areas.

Standard 6: Inspect, adjust, repair, or replace moveable glass and hardware. (1671.S.6)

Glass and Hardware Objectives
Students will:
1671.6.1 Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
1671.6.2 Repair or replace all power-driven accessories and related controls (including electrically-heated glass).
1671.6.3 Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair and replace weather stripping.
1671.6.4 Inspect, repair or replace, and adjust removable, manually-operated, roof panel, and hinges, latches, guides handles, retainer, and controls of sun roofs.

Mechanical and Electrical Components

This course will introduce students to the entry-level skills necessary in mechanical and electrical repairs as they apply to collision repair technology.

Standard 1: Inspect and service supplemental airbag restraint systems. (1673.S.1)

Airbag Restraint System Objectives
Students will:
1673.1.1 Disarm airbag system in accordance with manufacturer's procedures.
1673.1.2 Inspect and replace damaged sensors and wiring in accordance with manufacturer's procedures; insure proper sensor orientation.
1673.1.3 Verify that system is armed and operational in accordance with manufacturer's procedures.
1673.1.4 Remove and replace non-deployed airbag; observe manufacturer's safety procedures.
1673.1.5 Use fault codes to diagnose and repair airbag system.

Standard 2: Inspect and service passive restraint systems.

Passive Restraint System Objectives
Students will:
1673.2.1 Remove and replace seatbelt and shoulder harness assembly in accordance with manufacturer's procedures.
1673.2.2 Inspect anchorages for deformation; repair as required.
1673.2.3 Verify proper operation of seatbelt in accordance with manufacturer's procedures.
1673.2.4 Remove and replace track and drive assembly, lap retractor, torso retractor assembly, inboard buckle-lap retractor, knee blocker, etc.

Standard 3: Service active restraint systems. (1673.S.3)

Active Restraint System Objectives
Students will:
1673.3.1 Remove and replace seatbelt and shoulder harness assembly in accordance with manufacturer's procedures.
1673.3.2 Inspect anchorage for deformation; repair as required.

Standard 4: Identify, inspect, and repair suspension and steering systems. (1673.S.4)

Repair Suspension and Steering Systems Objectives
Students will:
1673.4.1 Inspect and replace rack and pinion steering gear, inner tie rod ends (sockets), and bellows boots.
1673.4.2 Remove and replace power steering gear (non-rack and pinion type).
1673.4.3 Remove and replace power steering pump; inspect pump mounts.
1673.4.4 Remove, replace, and adjust tie rods, tie rod sleeves, clamps, and tie rod ends (sockets).
1673.4.5 Remove and replace strut rods and bushings on long and short arm suspension systems.
1673.4.6 Remove and replace upper and lower ball joints on short and long arm suspension systems.
1673.4.7 Remove and replace steering knuckle/spindle assemblies.
1673.4.8 Remove and replace front and rear suspension components.
1673.4.9 Remove and replace shock absorbers.
1673.4.10 Diagnose vehicle wandering, pulling hard steering, bump steering, memory steering, torque steering, and steering return problems; determine needed repairs.
1673.4.11 Check and adjust caster on suspension systems with a caster adjustments.

1673.4.12 Measure vehicle ride height; determine needed repairs.
1673.4.13 Center steering wheel.
1673.4.14 Diagnose tire wear patterns; determine needed repairs.

Standard 5: Inspect and service air conditioning systems. (1673.S.5)

Air Conditioning System Objectives
Students will:
1673.5.1 Inspect, repair and replace air conditioner system hoses, lines, fittings, and related components (compressor, condenser, evaporator).
1673.5.2 Recharge air conditioner according to manufacturer's recommendations.

Standard 6: Inspect, adjust, and repair hydraulic brake systems. (1673.S.6)

Hydraulic Brake System Objectives
Students will:
1673.6.1 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, and supports.
1673.6.2 Inspect flexible brake hoses for leaks, kinks, cracks, bulging, or wear; tighten loose fittings and supports.
1673.6.3 Select, handle, store, and install brake fluids, (including silicone fluids).
1673.6.4 Bleed (manual, pressure, vacuum, or surge) and/or flush hydraulic brake system, in accordance with manufacturer's procedures.
1673.6.5 Pressure test brake hydraulic system by applying heavy force to pedal, hold for 15 seconds and inspect for leaks.
1673.6.6 Adjust brake shoes and reinstall brake drums or drum/hub assemblies and wheel 1673. bearings.
1673.6.7 Reinstall wheel, torque lug nuts, and make final checks for adjustments.
1673.6.8 Remove and replace caliper assembly.
1673.6.9 Clean and inspect; caliper mountings and slides for wear and damage.
1673.6.10 Check parking brake system operation.

Standard 7: Inspect and service cooling systems. (1673.S.7)

Cooling Systems Objectives
Students will:
1673.7.1 Inspect and replace engine cooling system hoses and belts.
1673.7.2 Drain, flush and refill system with proper coolant and level or protection.
1673.7.3 Inspect, remove and replace radiator, pressure cap, coolant recovery system, and water pump.
1673.7.4 Remove and replace fan, fan clutch (both electrical and mechanical), and fan shroud.

Standard 8: Analyze, repair, and replace electrical components. (1673.S.8)

Electrical Components Objectives
Students will:
1673.8.1 Check voltages in electrical wiring circuits with a voltmeter; determine needed repairs.
1673.8.2 Check continuity and resistance in electrical wiring circuits and components with an ohmmeter; determine needed repairs.
1673.8.3 Check electrical wiring circuits with jumper wires; determine needed repairs.
1673.8.4 Inspect, test, and replace fusible links, circuit breakers, and fuses.
1673.8.5 Perform battery state-of-charge in accordance with manufacturers recommendations.
1673.8.6 Identify programmable electrical/electronic components; record data from reprogramming before disconnecting battery.

1673.8.7 Inspect, clean, and repair or replace battery cables, connectors, and clamps.
1673.8.8 Inspect, adjust, and replace alternator drive belts, pulleys, and fans.
1673.8.9 Remove and replace alternator.
1673.8.10 Remove and replace headlights, parking/taillights, stop lights, flashers, turn-signals and backup lights; check operation.
1673.8.11 Inspect, replace, and aim headlights/bulbs.
1673.8.12 Check operation of retractable headlight assembly.
1673.8.13 Remove and replace motors, switches, relays, connectors, and wires of retractable headlight assembly circuits.
1673.8.14 Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and wires of all light circuits including four-wire taillight systems.

Non-Structural Analysis And Damage Repair

This course will introduce students to the entry-level skills necessary in non-structural analysis and repair of metal and composite parts.

Standard 1: Determine the extent of damage, plan method, and make outer body panel repairs, replacement and adjustments. (1675.S.1)

Outer Body Panel Repair Objectives
Students will:

1675.1.1 Determine the extent of the direct and indirect damage, the direction of impact, and plan the methods and order of repair.
1675.1.2 Determine the extent of damage to aluminum body panels; repair; weld or replace in accordance with manufacturer's specifications.
1675.1.3 Remove, replace and align hood, hood hinges, and hood latch.
1675.1.4 Remove, replace and align deck lid, lid hinges, and lid latch.
1675.1.5 Remove and replace doors, tailgates, hatches, lift gates, latches assemblies and hinges.
1675.1.6 Remove, replace and align bumpers, reinforcements, guards, isolators, and mounting hardware.
1675.1.7 Check and adjust clearances of front fenders, headers, and other panels.
1675.1.8 Check door hinge condition; check door frames for proper fit; check and adjust door clearances (where adjustable) along quarter panel, door, rocker panel, fender, and top.
1675.1.9 Repair or replace door skins and intrusion beams in accordance with vehicle manufacturer's specification.
1675.1.10 Straighten roughed out contours of damaged panel to a surface condition for body filling or metal finishing using power and hand tools.
1675.1.11 Weld cracked or torn steel body panels; re-weld broken welds.
1675.1.12 Heat shrink stretched panel areas back to contour, and restore contour with heat.
1675.1.13 Cold shrink stretched panel areas back to cover, and apply protective coatings and sealants.

Standard 2: Identify and repair various types of automotive plastics. (1675.S.2)

Automotive Plastics Objectives
Students will:

1675.2.1 Identify types of plastics to be repaired and their repair procedures.
1675.2.2 Repair rigid and flexible plastic parts with urethane or epoxy adhesives and fiberglass reinforcements according to vehicle and industry specifications.
1675.2.3 Remove damaged areas from rigid exterior sheet molded compound (SMC) panels and repair with partial panel installation.
1675.2.4 Retexture and refinish interior plastic parts.
1675.2.5 Repair vinyl-clad urethane foam parts.
1675.2.6 Reshape and shrink flexible exterior plastic parts.

Structural Analysis and Damage Repair

This course will introduce students to the entry-level skills necessary in structural analysis and repair of frame and unibody type vehicles using welding techniques, measuring equipment and frame machines.

Standard 1: Identify weld types, joints, welder setup and analyze weld defects. (1677.S.1)

Weld Objectives
Students will:

1677.1.1 Identify weldable and non-weldable materials used in autobody components.
1677.1.2 Determine correct electrode wire type, diameter and gas to be used in specific welding situations.
1677.1.3 Determine the correct type of weld and weld joint (continuous, stitch/pulse, tack, plug, etc,) for each specific weld repair.
1677.1.4 Identify safety considerations: eye protection, proper clothing, shock hazards, dangerous fumes, etc. before beginning welding operation.
1677.1.5 Set up and tune the welder in accordance with manufacturers' instructions; clean the gun and gas nozzle as required.
1677.1.6 Protect computers and other electronic modules from possible welding damage.
1677.1.7 Clean the metal to be welded; assure good metal fit through preparation and clamping.
1677.1.8 Use the proper angle of the gun to the joint, and the direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
1677.1.9 Identify cause(s) of splits and sputters, burn through, lack of penetration, cracks in metal, porosity, incomplete fusion, excessive spatter, distortion, and waviness of bead; make necessary adjustments.
1677.1.10 Identify cause(s) of contact tip burn-back and failure of wire to feed; make necessary adjustments.

Standard 2: Diagnose, measure and repair unibody and framed damage. (1677.S.2)

Unibody and Framed Damage Objectives
Students will:

1677.2.1 Diagnose and measure structural damage using tram and centering gauges according to manufacturer's specifications.
1677.2.2 Diagnose and measure unibody damage using a dedicated (fixture) or universal measuring system compared to specification.
1677.2.3 Attach body anchoring devices.
1677.2.4 Straighten and align all types of frame damage on a typical frame type vehicle (mash, sag, sideway, twist, kickup, diamond).
1677.2.5 Straighten and align structural panels on unibody type vehicles (roof, cowl, pillars, rockers, front and rear sections).
1677.2.6 Apply cold and heat stress relief methods and weld in accordance with vehicle manufacturer's recommendations.
1677.2.7 Remove and replace damaged frame horns, side rails, cross members and structural steel body panels in accordance with vehicle manufacturers recommendation/industry standards.
1677.2.8 Perform structural panel sectioning in accordance with vehicle manufacturers specifications/ industry standards.
1677.2.9 Restore corrosion protection to repaired structural areas in accordance with vehicle manufacturers specifications.

Standard 3: Remove and replace fixed glass using manufacturers procedures. (1677.S.3)

Fixed Glass Objectives

Students will:

1677.3.1 Remove and replace fixed glass (heated and non-heated) and modular glass using manufacturers procedures.

1677.3.2 Remove and replace butyl-retained and urethane-retained modular glass with mechanical fasteners.

1677.3.3 Determine when to use the partial cutout or the full cutout method of repair when replacing a windshield.

Surface Preparation and Refinishing

This course will introduce students to the entry-level skills necessary in the surface preparation and refinishing of vehicles using various refinishing systems.

Standard 1: Prepare a surface for refinishing using proper safety precautions. (1679.S.1)

Surface Safety Precautions Objectives
Students will:

1679.1.1 Remove and store trim and molding.
1679.1.2 Remove dirt, wax, road grime, and special coatings from area to be refinished. and from adjacent surfaces; wash entire vehicle.
1679.1.3 Inspect and identify type of finish and surface condition; develop a plan for refinishing.
1679.1.4 Chemically and mechanically remove paint finish where necessary.
1679.1.5 Featheredge and wet sand area to be refinished.
1679.1.6 Identify type of metal and apply suitable metal treatments.
1679.1.7 Mask trim and other areas that will not be refinished.
1679.1.8 Mix primer, primer-surface, or primer-sealer; spray onto surface of repaired area according to parts manufacturer's specifications.
1679.1.9 Dry or wet block sand areas to which primer-surface has been applied.
1679.1.10 Compound or prepare around the edge of the repaired area to be refinished.
1679.1.11 Blow dust from entire vehicle including cracks and moldings in the area to be refinished.
1679.1.12 Clean area to be refinished with a proper solvent.
1679.1.13 Remove, with a tack rag, any dust or lint particles from the area to be refinished.
1679.1.14 Apply recommended sealer to the area being refinished according to manufacturer's specifications.
1679.1.15 Scuff sand to remove nibs or over spray from a sealer.

Standard 2: Inspect, clean and operate spraying equipment. (1679.S.2)

Spraying Equipment Objectives
Students will:

1679.2.1 Inspect, clean, and determine condition and adequacy of spray guns and related equipment (air hose, regulator, air lines, and compressor).
1679.2.2 Check and adjust air pressure on the spray gun (includes siphon-feed, and gravity-feed).
1679.2.3 Adjust spray gun using fluid and pattern control valves.
1679.2.4 Check and adjust high volume, low pressure spraying equipment.

Standard 3: Mix, match, and apply various refinishing systems. (1679.S.3)

Refinishing Systems Objectives
Students will:

1679.3.1 Determine type and color of paint on vehicle.
1679.3.2 Shake, stir, thin or reduce, or strain paint according to manufacturer's recommendations.
1679.3.3 Select proper air pressure and spraying technique (gun arc, gun angle, gun distance, gun speed, and spay pattern overlap) for finish being applied.
1679.3.4 Apply selected product on test panel in accordance with manufacturers recommendations.
1679.3.5 Apply acrylic enamel, urethane and urethane basecoat/clearcoat for spot and panel blending, and overall refinishing.
1679.3.6 Check for color matching of all applied finishes.
1679.3.7 Select and perform sanding, buffing, and polishing processes for finish.
1679.3.8 Identify the types of rigid and flexible plastic parts to be finished; determine correct materials and refinishing procedures.
1679.3.9 Apply finish coat to rigid and flexible plastic parts.

1679.3.10 Clean, condition, and refinish vinyl (e.g., upholster, dashes, and tops).
1679.3.11 Clean and detail vehicle after complete refinishing.
1679.3.12 Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.

Standard 4: Identify and solve paint application problems and finish defects, and determine cause and cure. (1679.S.4)

Paint Application Objectives
Students will:
1679.4.1 Identify, prevent and correct all paint application problems that occur in refinishing operations.

Fundamentals of Broadcasting (Radio & TV)

This course will introduce students to the basic fundamentals needed to support broadcast managers in the production and broadcasting of materials or programs. Students will become familiar with the equipment, processes, and procedures used in producing and making radio and television broadcasts.

Standard 1: Identify, explore, and evaluate career opportunities related to radio and television production. (1681.S.1)

Radio and Television Production Objectives
Students will:

1681.1.1 Describe a variety of careers related to radio and television production, and the training necessary to be successful in those careers.
1681.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of radio and television production.
1681.1.3 Identify sources of information about careers in radio and television production.
1681.1.4 Describe the effect that computers and automation have and will have on the broadcast Industry.

Standard 2: Identify elements of radio broadcast equipment and procedures. (1681.S.2)

Radio Broadcast Objectives
Students will:

1681.2.1 Identify safety rules for operating radio broadcasting equipment.
1681.2.2 Define uses for electronic equipment (microphones, recorders, etc.) and proper care while operating.
1681.2.3 Demonstrate efficiency and accuracy while performing cue up and playing of records, compact disks, cassettes, open reel tapes and computerized audio files.
1681.2.4 Operate audio console and identify proper modulations levels.

Standard 3: Identify elements of television broadcast equipment and procedures. (1681.S.3)

Television Broadcast Objectives
Students will:

1681.3.1 Identify safety rules for operating television broadcasting equipment.
1681.3.2 Define uses for television broadcasting electronic equipment (microphones, cameras, etc.) and proper care while operating.
1681.3.3 Apply knowledge of camera shots and angles.
1681.3.4 Illustrate proper way to hold scripts and props.
1681.3.5 Identify problems of microphone and camera consciousness, and ways to overcome camera fright.
1681.3.6 Recognize and perform hand signals used in television broadcasting.
1681.3.7 Identify various types of video equipment.
1681.3.8 Demonstrate the ability to make minor repairs to lighting such as replacing defective bulbs, cables and equipment.
1681.3.9 Illustrate proper posture for on-air performance.
1681.3.10 Prepare and demonstrate use of cue cards.
1681.3.11 Select and demonstrate proper use of "hitting marks".

Radio Broadcast Applications

This course will provide students with the knowledge to perform, either in a live or mock setting, a radio broadcast.

Standard 1: Prepare material for on-air presentations. (1683.S.1)

Air Presentations Objectives
Students will:
1683.1.1 Describe FCC rules and regulations relating to radio broadcasting.
1683.1.2 Identify various news services, their differences and how they are used.
1683.1.3 Interpret wire service copy.
1683.1.4 Describe the importance of objectivity in story writing to avoid bias.
1683.1.5 Demonstrate proper conversational and broadcast news style writing skills.
1683.1.6 Read and use various editing techniques to rewrite scripts.
1683.1.7 Follow format clock and time news reports and programs correctly.
1683.1.8 Set up and make entries in an operating log and a program log.
1683.1.9 Write and produce a newscast.

Standard 2: Demonstrate basic skills for delivering on-air productions. (1683.S.2)

Basic Skills On Air Productions Objectives
Students will:
1683.2.1 Identify problems of voice quality and ways to overcome "mike fright".
1683.2.2 Interpret and perform hand signals used in radio broadcasting.
1683.2.3 Speak clearly and in conversational style when delivering a broadcast.
1683.2.4 Read, in an effective manner, copy written by someone else.
1683.2.5 Apply ad-libbing techniques.

Standard 3: Demonstrate advanced skills in radio production. (1683.S.3)

Advanced Skills in Radio Production Objectives
Students will:
1683.3.1 Clean magnetic heads on tape equipment and bulk erase tapes.
1683.3.2 Write a commercial or public service announcement.
1683.3.3 Preview, critique, and select segments for possible airing.
1683.3.4 Determine story priority for a news broadcast.
1683.3.5 Conduct and perform a sports interview, a live interview, and a remote broadcast.
1683.3.6 Prepare and broadcast sports and news commentaries and editorials.
1683.3.7 Design and execute special effects.
1683.3.8 Conduct market research.

Television Production Applications

This course will provide students with an entry-level understanding of the components of television broadcasting.

Standard 1: Operate television broadcast equipment. (1685.S.1)

Operate Television Broadcast Equipment Objectives
Students will:
1685.1.1 Take a level.
1685.1.2 Adjust camera control unit.
1685.1.3 Set up lights for production purposes.
1685.1.4 Operate a switcher, an audio board, a video recorder and a tele-prompter.
1685.1.5 Switch studio lights on during broadcast following script or instructions from director.

Standard 2: Utilize proper television techniques to develop quality productions. (1685.S.2)

Quality Productions Objectives
Students will:
1685.2.1 Use various script formats.
1685.2.2 Set up equipment and conduct a one-person field interview.
1685.2.3 Perform a live interview.
1685.2.4 Assemble a videotape "package" (studio and field types).
1685.2.5 Assign staff personnel to operate and direct broadcasting activities.
1685.2.6 Apply ad-libbing techniques.
1685.2.7 Prepare and broadcast sports, news, commentaries, and editorials.
1685.2.8 Properly apply makeup for television broadcasting.
1685.2.9 Design and construct a set.
1685.2.10 Write and produce a newscast.

Standard 3: Demonstrate television production editing skills. (1685.S.3)

Editing Skills Objectives
Students will:
1685.3.1 Design and use electronic graphics.
1685.3.2 Operate a time base corrector (TBC)
1685.3.3 Perform electronic and manual edits.
1685.3.4 Read, edit and rewrite scripts.
1685.3.5 Time news reports correctly, and edit if necessary.
1685.3.6 Set up and make entries in an operating log and a program log.

Standard 4: Demonstrate television production troubleshooting skills and special techniques. (1685.S.4)

Skills and Special Techniques Objectives
Students will:
1685.4.1 Identify common symptoms of head clogs and tracking problems.
1685.4.2 Apply news judgment to field interviewing.
1685.4.3 Design and perform special effects.
1685.4.4 Prepare an instruction sheet or manual on video taping filed stories (both storyboard and script).

A+ Service Technician

This course will provide the knowledge and skills to identify, configure and upgrade microcomputer modeling and peripherals, safety and preventive maintenance procedures. Also included will be specific terminology, categories and principles of motherboard, procedures and memory in microcomputer systems. Diagnosing and troubleshooting common and system malfunctions and networking concepts will be included.

Standard 1: Perform installation, configurations, and upgrading of computers. (1701.S.1)

Computers Objectives
Students will:

1701.1.1 Identify basic terms, concepts, and functions of system modules, including how each module should work during normal operation and during the boot process.
1701.1.2 Identify basic procedures for adding and removing field replaceable modules for both desktop and portable systems.
1701.1.3 Identify available IRQ's, DMA's, and I/O addresses and procedures for device installation and configuration.
1701.1.4 Identify common peripheral ports, associated cabling, and their connectors.
1701.1.5 Identify proper procedures for installing and configuring IDE/EIDE devices.
1701.1.6 Identify proper procedures for installing and configuring SCSI devices.
1701.1.7 Identify proper procedures for installing and configuring peripheral devices.
1701.1.8 Identify hardware methods of upgrading system performance, procedures for replacing basic subsystem components, unique components and when to use them.

Standard 2: Demonstrate diagnosing and troubleshooting procedures. (1701.S.2)

Procedures Objectives
Students will:

1701.2.1 Identify common symptoms and problems associated with each module and how to troubleshot and isolate the problems.
1701.2.2 Identify basic troubleshooting procedures and how to elicit problem symptoms from customers.

Standard 3: Perform preventative maintenance procedures. (1701.S.3)

Preventative Maintenance Procedures Objectives
Students will:

1701.3.1 Identify common symptoms and problems associated with each module and how to troubleshoot and isolate the problems.
1701.3.2 Identify basic troubleshooting procedures and how to elicit problem symptoms from customers.

Standard 4: Identify the Motherboard/Processors/Memory parts of the computer. (1701.S.4)

Parts of the Computer Objectives
Students will:

1701.4.1 Distinguish between the popular CPU chips in their basic characteristics.
1701.4.2 Identify the categories of RAM (Random Access Memory) terminology, their locations, and physical characteristics.
1701.4.3 Identify the most popular type of motherboards, their components, and their architecture (bus structures and power supplies).
1701.4.4 Identify the purpose of CMOS (Complementary Metal-Oxide Semiconductor), what it contains and how to change its basic parameters.

Standard 5: Demonstrate knowledge of various printers. (1701.S.5)

Printers Objectives
Students will:
1701.5.1 Identify basic concepts, printer operations and printer components.
1701.5.2 Identify care and service techniques and common problems with primary printer types.

Standard 6: Demonstrate basic networking knowledge. (1701.S.6)

Basic Networking Objectives
Students will:
1701.6.1 Identify basic networking concepts, including how a network works and the ramifications of repairs on the network.

Computer Maintenance And Repair

This course will provide students with the necessary skills to detect and correct hardware and software faults in personal computers.

Standard 1: Demonstrate safe practices when working with electronic devices. (1703.S.1)

Safe Practices Objectives
Students will:
1703.1.1 Identify types of computer viruses and the methods of removing and protecting against them.
1703.1.2 Identify and demonstrate proper usage of the components of a basic technician's toolkit.
1703.1.3 Demonstrate proper use of a multimeter.

Standard 2: Identify and define hardware. (1703.S.2)

Hardware Objectives
Students will:
1703.2.1 Demonstrate knowledge of basic systems components.
1703.2.2 Use a block diagram to identify the ALU, control and memory components of the system unit and explain each.
1703.2.3 Describe the differences between RAM and ROM memory.
1703.2.4 Identify and explain the usage of several of the more common input devices.
1703.2.5 Identify several special-purpose output devices.
1703.2.6 Describe the differences between monochrome and color display screens.
1703.2.7 Identify and explain the difference between impact and non impact printers.
1703.2.8 Describe the need for auxiliary storage devices.
1703.2.9 Identify the various types and characteristics of auxiliary storage devices.
1703.2.10 Identify several of the more common magnetic disk devices, explain how they function, and describe how they are used.
1703.2.11 Identify optical storage devices, explain how they function, and describe how they are used.
1703.2.12 Identify magnetic tape devices, explain how they function, and are used.
1703.2.13 Identify and explain the difference between cathode ray tube (CRT) and liquid crystal display (LCD) technology.
1703.2.14 Identify and describe interactive processing and batch processing.

Standard 3: Troubleshoot system components. (1703.S.3)

System Components Objectives
Students will:
1703.3.1 Demonstrate correct system disassembly and reassembly.
1703.3.2 Identify and correct common faults in system unit components.
1703.3.3 Identify and correct common faults in I/O devices.
1703.3.4 Identify and correct common faults in operating system components and drives.
1703.3.5 Identify and correct common faults in applications.
1703.3.6 Utilize operating system components, diagnostic software and supplied documentation to detect and correct faults.
1703.3.7 Understand the proper procedure for contacting technical support services.

Standard 4: Demonstrate proper customer support procedures. (1703.S.4)

Proper Customer Support Objectives
Students will:
1703.4.1 Demonstrate proper telephone and personal etiquette.

1703.4.2 Discuss various questioning techniques.
1703.4.3 Perform after-call follow-up.
1703.4.4 Maintain logs.

Fundamentals of Computer Systems

This course will introduce students to the entry-level job skills related to the computer industry, as well as give them a solid foundation for college study in the computer sciences. Students will become familiar with computer operating systems, operational software, and networking of systems.

Standard 1: Identify, explore, and evaluate career opportunities related to computer systems. (1705.S.1)

Computer Systems Objectives
Students will:

1705.1.1 Describe a variety of careers related to computer systems, and the training necessary to be successful in those careers.
1705.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of computer systems.
1705.1.3 Identify sources of information about careers in computer systems.

Standard 2: Demonstrate a knowledge of information processing. (1705.S.2)

Information Processing Objectives
Students will:

1705.2.1 List the four elements of the information processing cycle and explain the purpose of each.
1705.2.2 Use a block diagram to identify the ALU, control and memory components of the system unit and explain each.
1705.2.3 Describe the difference between RAM and ROM memory.
1705.2.4 Identify and explain the usage of several of the more common input devices, and identify several special-purpose input devices.
1705.2.5 Identify and explain the usage of several of the more common output devices, and identify several special-purpose output devices.
1705.2.6 Identify and explain the difference between impact and non-impact printers.
1705.2.7 Identify the various types and characteristics of auxiliary storage devices, and the need for them.
1705.2.8 Identify several of the more common magnetic disk devices, explain how they function, and describe how they are used.
1705.2.9 Identify optical storage devices, explain how they function, and describe how they are used.
1705.2.10 Identify magnetic tape devices, explain how they function, and describe how they are used.
1705.2.11 Identify various displays available, and explain the difference between cathode ray tube (CRT) and liquid crystal display (LCD) technology.
1705.2.12 Identify and describe interactive processing and batch processing.

Standard 3: Demonstrate a knowledge of trends and issues in the computer industry. (1705.S.3)

Computer Industry Objectives
Students will:

1705.3.1 Discuss the ethical problems facing the computer industry.
1705.3.2 Demonstrate a knowledge of future uses of computer systems, using current literature.

Standard 4: Demonstrate a knowledge of data structure. (1705.S.4)

Data Structure Objectives
Students will:

1705.4.1 List the two most commonly used coding schemes.
1705.4.2 Define bits, bytes, fields, records and files.

Standard 5: Demonstrate a knowledge of data communications. (1705.S.5)

Data Communications Objectives
Students will:
1705.5.1 Describe the basic components of a data communications system.
1705.5.2 Discuss various methods and media of networking.

Standard 6: Utilize and define an operating system. (1705.S.6)

Operating System Objectives
Students will:
1705.6.1 Define the purpose and functions of an operating system.
1705.6.2 Compare and contrast the capabilities of single-user environments and multi-tasking environments.
1705.6.3 Describe some of the issues of operating system compatibility.
1705.6.4 Effectively use an operating system to view directories, format disks, and copy, rename, and delete files.
1705.6.5 Maintain operation logs.

Standard 7: Demonstrate the use of operational software for system troubleshooting. (1705.S.7)

Operational Software Objectives
Students will:
1705.7.1 Perform operator diagnostic troubleshooting on a microcomputer system.
1705.7.2 Correct faults identified by troubleshooting.

Systems Software

This course provides an overview of operating system concepts, the use of personal computer operating systems, data communications, networking concepts and utilization, and an introduction to the Internet.

Standard 1: Demonstrate knowledge of operating system components. (1707.S.1)

Operating System Components Objectives
Students will:
1707.1.1 Define operating system.
1707.1.2 Compare and contrast command-driven, menu-driven and icon-driven operating systems.
1707.1.3 Compare and contrast single-tasking versus multitasking operating system.
1707.1.4 Describe various personal computer operating systems in use today.

Standard 2: Utilize an operating system. (1707.S.2)

Operating System Objectives
Students will:
1707.2.1 Install and configure an operating system.
1707.2.2 Effectively use an operating system to complete a variety of operations.
1707.2.3 Use supplied documentation.

Standard 3: Demonstrate knowledge of data communications. (1707.S.3)

Data Communications Objectives
Students will:
1707.3.1 Define networking, and describe the basic components of a data communications system.
1707.3.2 Describe the difference between local and remote terminals.
1707.3.3 Define a Local Area Network (LAN) and a Wide Area Network (WAN).
1707.3.4 Compare and contrast various transmission methods and media.
1707.3.5 Compare and contrast peer-to-peer, client-server, host-based time sharing, and dedicated file servers.

Standard 4: Utilize a Network Operating System. (1707.S.4)

Network Operating System Objectives
Students will:
1707.4.1 Install and configure NOS on servers and clients.
1707.4.2 Utilize NOS to complete a variety of tasks.

Standard 5: Demonstrate knowledge of the Internet. (1707.S.5)

Knowledge of the Internet Objectives
Students will:
1707.5.1 Define the Internet and discuss its historical evolution.
1707.5.2 Utilize various components of the Internet including WWW, email, news groups, search engines, and FTP facilities.
1707.5.3 Utilize browsers to access www facilities.

Technical Computer Applications

This course will introduce students to the basic principles of computer programming, including program design and implementation. Students will obtain an in-depth understanding of computer software.

Standard 1: Demonstrate knowledge of word processing software. (1709.S.1)

Word Processing Software Objectives
Students will:
1709.1.1 Create a document with proper formatting.
1709.1.2 Modify a document, then print copies.

Standard 2: Demonstrate knowledge of an electronic spreadsheet. (1709.S.2)

Electronic Spreadsheet Objectives
Students will:
1709.2.1 Create, save and print a copy of a basic worksheet.
1709.2.2 Modify an existing worksheet.
1709.2.3 Create a worksheet graph.

Standard 3: Demonstrate knowledge of computer graphics. (1709.S.3)

Computer Graphics Objectives
Students will:
1709.3.1 Define computer graphics and list three uses of graphics software.
1709.3.2 Create a graphic with graphics software.

Standard 4: Demonstrate knowledge of presentation software. (1709.S.4)

Presentation Software Objectives
Students will:
1709.4.1 Plan and create a presentation using presentation software.
1709.4.2 Deliver a presentation, using proper speaking techniques and effectively use the computer generated presentation.

Standard 5: Demonstrate knowledge of database software. (1709.S.5)

Database Software Objectives
Students will:
1709.5.1 Create a database file and enter data into the database.
1709.5.2 Sort a database file and create a printed document of the information.
1709.5.3 Update a database file.

Standard 6: Demonstrate knowledge of other relevant technical computer applications as appropriate. (1709.6.1)

Other Computer Applications Objectives
Students will:
1709.6.1 Discuss and demonstrate the efficient use of other various types of software.

Standard 7: Demonstrate a fundamental knowledge of computer programming languages. (1709.S.7)

Computer Programming Languages Objectives

Students will:

1709.7.1 Define a computer program, and identify programs written in two different languages.

1709.7.2 List four of the most popular programming languages used today, and match each with its appropriate environment.

Standard 8: Demonstrate knowledge of program development. (1709.S.8)

Program Development Objectives

Students will:

1709.8.1 Define the basic steps in the programming cycle.

1709.8.2 Identify and describe the most common flowchart symbols.

1709.8.3 Describe the differences between a system flowchart and a program flowchart.

1709.8.4 Describe file organization and access for sequential files, indexed files, and relative (or direct) files.

Standard 9: Utilize a programming language. (1709.S.9)

Programming Language Objectives

Students will:

1709.9.1 Define a programming problem, and plan a solution to the problem.

1709.9.2 Code, test and debug the program you designed.

1709.9.3 Provide appropriate documentation for the program.

Web Development and Support

This course is an introduction to web site development and web server support.

Standard 1: Demonstrate knowledge of the structure and functions of the World Wide Web (WWW). (1711.S.1)

World Wide Web Objectives
Students will:
1711.1.1 Describe the structure of the www.
1711.1.2 Discuss the various types and uses of web pages.
1711.1.3 Discuss the development and uses of HTML.

Standard 2: Demonstrate knowledge of web publishing. (1711.S.2)

Web Publishing Objectives
Students will:
1711.2.1 Effectively utilize an HTML editor.
1711.2.2 Plan and code a site, then post it on the www.
1711.2.3 Register a site with a search engine.
1711.2.4 Discuss the purpose of a domain name, and the procedure for obtaining a domain name.

Standard 3: Discuss proper procedures for accessing the WWW. (1711.S.3)

WWW Objectives
Students will:
1711.3.1 Discuss the importance and implications of an Acceptable Use Policy.
1711.3.2 Demonstrate the use of appropriate screening software.
1711.3.3 Discuss the concepts of ethical behavior, security, and user privacy on the WWW.

Standard 4: Demonstrate knowledge of web support procedure. (1711.S.4)

Web Support Procedure Objectives
Students will:
1711.4.1 Define web server.
1711.4.2 Setup and configure a web server, and perform daily administrative and maintenance tasks on it.
1711.4.3 Maintain a log.

Drafting Specialization - Architectural

This course will provide students the opportunity to specialize in architectural drawing and design, including plumbing, electrical and HVAC systems. The student will choose one of these areas to do in-depth study during this course.

Standard 1: Demonstrate the ability to design and draw domestic and commercial piping systems. (1721.S.1)

Commercial Piping Systems Objectives
Students will:

1721.1.1 Demonstrate knowledge of domestic and commercial piping system terminology and materials.
1721.1.2 Demonstrate the ability to interpret and draw domestic and commercial piping schematic flow diagrams.
1721.1.3 Demonstrate the ability to use a CAD system to design and develop drawings for domestic and commercial piping.

Standard 2: Demonstrate the ability to design and draw electrical systems. (1721.S.2)

Electrical Systems Objectives
Students will:

1721.2.1 Demonstrate knowledge of electrical system terminology and materials.
1721.2.2 Demonstrate the ability to interpret and draw electrical diagrams.
1721.2.3 Demonstrate the ability to use a CAD system to design and develop drawings for electrical systems.

Standard 3: Demonstrate the ability to design and draw HVAC systems. (1721.S.3)

HVAC Systems Objectives
Students will:

1721.3.1 Demonstrate knowledge of HVAC system terminology and materials.
1721.3.2 Demonstrate the ability to interpret and draw HVAC diagrams.
1721.3.3 Demonstrate the ability to use a CAD system to design and develop drawings for HVAC systems.

Standard 4: Apply architectural techniques to design and draw building structures. (1721.S.4)

Building Structures Objectives
Students will:

1721.4.1 Demonstrate knowledge of building styles, material selection and price estimates and architectural terms.
1721.4.2 Demonstrate the ability and knowledge to determine structural design required for client needs and purposes.
1721.4.3 Draw and dimension all necessary drawings for the completion of the structure, including floor plan, elevations and exterior presentation (two point, three point, etc.), etc.
1721.4.4 Demonstrate the ability to use a CAD system to design and develop architectural drawings.

Drafting Specialization-Civil

This course will provide students the opportunity to specialize in civil drafting and design, including and introduction to mapping, cartography techniques, and elementary structural steel design.

Standard 1: Utilize civil drawing techniques and proper cartography to develop accurate maps and construction drawings. (1723.S.1)

Maps and Construction Drawings Objectives
Students will:

1723.1.1 Demonstrate a knowledge of common maps, earth directions (latitude, longitude, relationship to sea level), convert azimuth to bearings and reverse, plot traverses, contours, profiles and other math computations.
1723.1.2 Draw/plot land from legal descriptions and/or write legal descriptions from notes.
1723.1.3 Demonstrate understanding of structural design and of weight supports (bridge, tower, road designs).

Standard 2: Demonstrate the ability to design and draw structural steel fabrications. (1723.S.2)

Structural Steel Fabrications Objectives
Students will:

1723.2.1 Demonstrate knowledge of structural terms, symbols and materials (steel, concrete, etc.).
1723.2.2 Demonstrate familiarity with sheer moment, stress and methods to compute required structural size.
1723.2.3 Demonstrate ability to correctly design and draw structural members and connections.
1723.2.4 Draw plans of elevations and pictorials.
1723.2.5 Demonstrate the ability to use a CAD system to design and develop drawings for steel fabrications.

Standard 3: Utilize CAD and MAPP software to create drawings from field notes. (1723.S.3)

CAD and MAPP Software Objectives
Students will:

1723.3.1 Demonstrate knowledge of field surveying notes and their applications to plan drawings.
1723.3.2 Complete downloading and editing of raw data to achieve the appropriate format.
1723.3.3 Demonstrate knowledge of modeling and overlap using surveying data.

Drafting Specialization - Mechanical

This course will introduce students to mechanical drafting, including the application of dimensioning techniques, assembly and detail drawings, pictorial views and common threads and fasteners. This course will provide the training to apply these applications using a CAD system.

Standard 1: Demonstrate the proper use and knowledge of advanced dimensioning techniques. (1725.S.1)

Advanced Dimensioning Techniques Objectives
Students will:
1725.1.1 Demonstrate knowledge of advanced dimensioning terminology and basic principals of fit selection.
1725.1.2 Apply tolerance dimensions, positional and form tolerance symbols.

Standard 2: Construct various types of assembly and detail drawings. (1725.S.2)

Assembly and Detail Drawings Objectives
Students will:
1725.2.1 Identify types of assembly drawings, detail parts within, and dimension detailed assembly drawings.
1725.2.2 Draw title and revision blocks, make and record drawing revisions, specify shop notes, and draft the necessary bill of materials on a drawing.
1725.2.3 Draw sectional and detailed working assembly drawings.

Standard 3: Identify and draw common threads and fasteners. (1725.S.3)

Threads and Fasteners Objectives
Students will:
1725.3.1 Demonstrate knowledge of common threaded fasteners, thread forms, series and classification of fits.
1725.3.2 Specify keys, keyways and taper pins, etc.
1725.3.3 Draw threaded fasteners using detailed and schematic representations.

Standard 4: Use computer assisted drafting to produce drawings, demonstrating competency in using advanced CAD systems. (1725.S.4)

CAD Systems Objectives
Students will:
1725.4.1 Use advanced drawing and editing features within a CAD system.
1725.4.2 Obtain numerical and database information from a CAD system.
1725.4.3 Use operating system functions within the CAD program.
1725.4.4 Demonstrate the ability to efficiently print/plot specified drawings.
1725.4.5 Develop 3-D objects on a CAD system.
1725.4.6 Use specialized CAD software to design and develop mechanical drawings and models (Mechanical Desktop).
1725.4.7 Develop 3-D objects using CNC.

Drafting Techniques

This course will introduce students to techniques used in advanced orthographic projection, including dimensioning, sectioning, auxiliary views, revolutions, pattern development and advanced CAD.

Standard 1: Apply proper sectioning techniques to fully describe the interior of an object on a drawing. (1727.S.1)

Proper Sectioning Techniques Objectives
Students will:
1727.1.1 Describe the purpose of a cutting plane and cutting plane line, and properly draw them.
1727.1.2 Draw various ANSI standard section lines used for general sections, steel, concrete, etc.
1727.1.3 Describe the differences between a full, half, revolved, aligned, offset, removed and broken out sections, and use sectioning techniques to complete drawings.

Standard 2: Identify and construct pictorial views. (1727.S.2)

Pictorial Views Objectives
Students will:
1727.2.1 Construct oblique and isometric drawings, including exploded and sectional views.
1727.2.2 Apply standard, horizontal and reverse axes in isometric drawings.
1727.2.3 Draw non-isometric lines, circles arcs, and curved lines.

Standard 3: Draw primary and secondary auxiliary views and revolutions. (1727.S.3)

Auxiliary Views and Revolutions Objectives
Students will:
1727.3.1 Demonstrate knowledge of primary auxiliary views.
1727.3.2 Draw secondary auxiliary views and explain their use.
1727.3.3 Demonstrate knowledge of revolutions and their use.

Standard 4: Apply descriptive geometry techniques to solve graphical problems. (1727.S.4)

Geometry Techniques Objectives
Students will:
1727.4.1 Determine the true length of a line, true view of a plane and the true angle between two planes.
1727.4.2 Determine the intersection between lines, planes, and surfaces.

Standard 5: Use proper techniques to draw patterns and developments. (1727.S.5)

Patterns and Developments Objectives
Students will:
1727.5.1 Develop rectangular prisms, cylinders, pyramids and cones.
1727.5.2 Demonstrate knowledge of transition pieces.
1727.5.3 Apply development techniques to shop patterns.

Standard 6: Apply the rules of dimensioning to dimension drawings, using architectural, engineering and metric measurements. (1727.S.6)

Rules of Dimensioning Objectives
Students will:

1727.6.1 Layout, measure and construct lines with the architectural, engineering and metric scales.
1727.6.2 Describe and apply unidirectional and aligned systems of dimensioning.
1727.6.3 Apply standard dimensioning techniques for a hole, countersink, counter bore and knurling.
1727.6.4 Properly dimension axonometric drawings.

Standard 7: Use computer assisted drafting to produce drawings, demonstrating the ability to customize a CAD system. (1727.S.7)

Computer Assisted Drafting Objectives
Students will:
1727.7.1 Create and use various prototype drawings using custom developed line types, hatch patterns and text styles.
1727.7.2 Modify CAD menu to perform additional and/or new operations.
1727.7.3 Demonstrate the ability to modify operating system files to facilitate CAD operations and load and run a lisp routine.

Fundamentals Of Drafting

This course will introduce students to the basic fundamentals of drafting and geometric construction. Students will become familiar with drafting equipment and methodology used in industry. This course will provide basic understanding of drafting techniques necessary to allow students to progress to CAD.

Standard 1: Identify, explore, and evaluate career opportunities related to drafting and design. (1729.S.1)

Drafting and Design Objectives
Students will:
1729.1.1 Describe a variety of careers related to drafting and design, and the training necessary to be successful in those careers.
1729.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of drafting and design.
1729.1.3 Identify sources of information about careers in drafting.

Standard 2: Identify and properly use a variety of basic drafting equipment and materials. (1729.S.2)

Basic Drafting Equipment and Materials Objectives
Students will:
1729.2.1 Describe and properly use standard drafting tools and machines such as triangles, protractors, scales, erasing shield, pencils, pens, erasers, compass and dividers.
1729.2.2 List the standard size sheets for drawing, and describe the difference between tracing paper, vellum and drafting film.

Standard 3: Apply mathematical skills related to drafting and design. (1729.S.3)

Mathematical Skills Objectives
Students will:
1729.3.1 Perform mathematical computations as they relate to creating accurate drawings.
1729.3.2 Interpret various charts and graphs used to display numerical data.
1729.3.3 Layout, measure and construct lines with the architectural scales.

Standard 4: Demonstrate proper drafting techniques when solving a variety of drafting problems. (1729.S.4)

Drafting Objectives
Students will:
1729.4.1 Identify and draw the various standard ANSI lines, borders and title blocks used in the drafting/design industry.
1729.4.2 Properly draw basic geometric shapes using equipment, and layout basic geometric constructions to demonstrate bisection, perpendicular, parallel, tangent, division, etc.
1729.4.3 Demonstrate proper techniques for lettering freehand and with mechanical lettering devices.

Standard 5: Demonstrate proper techniques to develop multi-view drawings using orthographic projection. (1729.S.5)

Multi-View Drawings Objectives
Students will:
1729.5.1 Apply proper isometric sketching techniques to aid in visualization of orthographic drawings.
1729.5.2 Arrange and layout the three principle views of an object on a standard ANSI sheet, using

proper centering techniques.

1729.5.3 Select the proper views necessary to completely describe an object, and complete technical drawings using these views.

Standard 6: Apply general rules to dimension drawings, using architectural measurements. (1729.S.6)

Dimension Drawings Objective

Students will:

1729.6.1 List and draw basic dimensions lines such as extension, dimension and leader lines.

Standard 7: Use computer assisted drafting to produce drawings, demonstrating basic functions of CAD. (1729.S.7)

CAD Objectives

Students will:

1729.7.1 Properly use software to create drawings using basic commands.

1729.7.2 Dimension the drawing, using appropriate commands.

1729.7.3 Properly save and plot a drawing.

Cosmetology Science

This course will provide the student with information on human anatomy and the effects of the chemistry of products used in cosmetology.

Standard 1: Demonstrate knowledge of anatomy. (1731.S.1)

Anatomy Objectives
Students will:
1731.1.1 Match terms associated with body systems to the correct definitions.
1731.1.2 Match the body systems to the correct functions.
1731.1.3 Plot the cell divisions and their functions.
1731.1.4 Match types of tissues to their correct functions.
1731.1.5 Select from a list the major body organs.
1731.1.6 Distinguish between anabolism and catabolism.
1731.1.7 Distinguish between cartilage and ligament.
1731.1.8 Match the parts of a bone to the correct descriptions.
1731.1.9 Discriminate the function of the bones.
1731.1.10 Identify bones of the face and head.
1731.1.11 Identify bones of the arm and hand.
1731.1.12 Match types of joints to the correct locations.
1731.1.13 Match types of muscles to their correct descriptions.
1731.1.14 Match the parts of a muscle to their correct descriptions.
1731.1.15 Identify muscles of the face and head.
1731.1.16 Match muscles of the face and head to the correct functions.
1731.1.17 Identify types of nerve.
1731.1.18 Distinguish between sensory and motor nerves.

Standard 2: Demonstrate a knowledge of the composition of various products used in cosmetology. (1731.S.2)

Cosmetology Objectives
Students will:
1731.2.1 Match terms associated with product chemistry to the correct definitions.
1731.2.2 Identify symbols of various elements.
1731.2.3 Distinguish between acids and bases.
1731.2.4 Interpret the basic characteristics of pH scale.
1731.2.5 Recall the chemistry of water.
1731.2.6 Distinguish between organic and inorganic chemistry.
1731.2.7 Distinguish between physical and chemical changes.
1731.2.8 Distinguish between elements and compounds.
1731.2.9 Define solution.
1731.2.10 Distinguish between a suspension and an emulsion.
1731.2.11 Match products used for sterilization and sanitation in the salon to their proper functions.
1731.2.12 Select from a list the basic facts about shampoo.
1731.2.13 Describe the chemical reaction of hair relaxers and permanent waves.
1731.2.14 State the chemical reaction of various hair color products.
1731.2.15 Match various products used in cosmetology to the correct chemical make-up.

Fundamentals of Business Management

This course will provide the knowledge and skills to operate and manage a cosmetology salon.

Standard 1: Demonstrate knowledge and skills needed for opening a salon. (1733.S.1)

Salon Objectives
Students will:
1733.1.1 Match terms associated with site planning to the correct definitions.
1733.1.2 Repeat the characteristics of various types of salons.
1733.1.3 Match types of ownerships to the correct descriptions.
1733.1.4 Distinguish between lease and rent.
1733.1.5 Name clauses that may be included in a complex lease.
1733.1.6 Describe a tentative contract.
1733.1.7 Identify factors to consider before owning, leasing, or renting a business.
1733.1.8 State permits, licenses, and public utilities necessary for opening a salon.
1733.1.9 Select from a list sources available for financing a business.
1733.1.10 Plan a salon site.

Standard 2: Demonstrate knowledge of salon management. (1733.S.2)

Salon Management Objectives
Students will:
1733.2.1 Match terms associated with salon planning and management to the correct definitions.
1733.2.2 Cite factors to consider when selecting the salon name.
1733.2.3 Select from a list basic implements and equipment needed for the salon.
1733.2.4 Select from a list color schemes appropriate for a salon.
1733.2.5 Choose basic rules for preparing window displays.
1733.2.6 Explain decorating the reception area.
1733.2.7 Formulate the styling area arrangements.
1733.2.8 List items to consider when setting up a dispensary (supply room).
1733.2.9 Tally items to include in a salon operating budget.
1733.2.10 Match types of insurance available to the correct definitions.
1733.2.11 Describe taxes and laws pertaining to a salon.
1733.2.12 Match various salary alternatives to the proper definitions.
1733.2.13 Name supplies which should be purchased.
1733.2.14 Describe methods of advertising.
1733.2.15 Design a salon.

Fundamentals of Hairstyling

This course will provide the knowledge and skills for working with hair and scalp, scalp treatment, shampoo and rinse, facial shapes, hair styles, wiggery, hair relaxer and hair coloring.

Standard 1: Demonstrate knowledge and skill in structure of hair and scalp. (1735.S.1)

Hair and Scalp Objectives
Students will:
1735.1.1 Match terms associated with scalp and hair analysis to the correct definitions.
1735.1.2 Discuss the composition of hair.
1735.1.3 Identify the layers of hair root shaft.
1735.1.4 Identify parts of the hair root area.
1735.1.5 Match parts of the hair root area to the correct functions.
1735.1.6 Match types of hair texture to their characteristics.
1735.1.7 Distinguish between hair porosity and hair elasticity.
1735.1.8 Identify sterilization and sanitation rules to observe during scalp and hair analysis.
1735.1.9 Identify scalp disorders.
1735.1.10 Match scalp disorders to the proper treatments.
1735.1.11 Identify scalp disorders that should not be treated in a salon.
1735.1.12 Name conditions that affect hair growth.
1735.1.13 Prescribe treatments for scalp and hair problems.

Standard 2: Display knowledge and skill in scalp treatment. (1735.S.2)

Scalp Treatment Objectives
Students will:
1735.2.1 Match terms associated with brushing and scalp treatment to the correct definitions.
1735.2.2 Select from a list types of scalp treatments.
1735.2.3 Identify scalp conditions that can be treated by a cosmetologist.
1735.2.4 Match scalp problems to the necessary treatments.
1735.2.5 Identify equipment needed for scalp treatments.
1735.2.6 Select from a list general safety precautions to observe while performing scalp treatments.
1735.2.7 Develop safety precautions to observe while using high-frequency current.
1735.2.8 Distinguish between methods of applying high-frequency current for scalp treatment.
1735.2.9 Distinguish between the use of the ultra-violet ray and the infra-red ray.
1735.2.10 Prescribe treatment for scalp problems.
1735.2.11 Drape a patron.
1735.2.12 Brush hair for a scalp treatment.
1735.2.13 Perform scalp manipulations.
1735.2.14 Apply direct and indirect high-frequency current treatments to scalp.
1735.2.15 Apply therapeutic rays to scalp.
1735.2.16 Apply heat cap scalp treatment.

Standard 3: Demonstrate the ability to give a shampoo and apply rinse. (1735.S.3)

Shampoo and Apply Rinse Objectives
Students will:
1735.3.1 Match terms associated with shampoos and rinses to the correct definitions.
1735.3.2 Itemize types of shampoos.
1735.3.3 Match types of shampoos to the correct functions.
1735.3.4 Identify types of rinses.
1735.3.5 Match types of rinses to the correct functions.
1735.3.6 State safety precautions to observe during a shampoo.
1735.3.7 Identify parts of the pH scale.

1735.3.8 Give a shampoo.
1735.3.9 Apply acid rinse.
1735.3.10 Apply crème rinse.
1735.3.11 Apply instant color rinse.

Standard 4: Coordinate facial shapes with hair types. (1735.S.4)

Facial Shapes With Hair Types Objectives
Students will:
1735.4.1 Match terms associated with facial shapes and body structures to the correct definitions.
1735.4.2 Identify facial shapes.
1735.4.3 Match facial shapes to the correct characteristics.
1735.4.4 Identify facial profiles.
1735.4.5 Match facial profile shapes to the correct characteristics.
1735.4.6 Identify body structures that are used to determine hairstyles.
1735.4.7 Match facial shapes to the appropriate hairstyles.
1735.4.8 Match facial profile shapes to appropriate hairstyles.
1735.4.9 Match body structures to the appropriate hairstyles.
1735.4.10 Label the major sections of the head.
1735.4.11 Indicate proportions of the ideal face.
1735.4.12 Measure facial features.

Standard 5: Demonstrate how to make a shaping and wave. (1735.S.5)

Shaping and Wave Objectives
Students will:
1735.5.1 Match terms associated with shaping to the correct definitions.
1735.5.2 Identify the styling section of the head.
1735.5.3 Match styling sections of the head to the correct functions.
1735.5.4 State the purpose of a shaping.
1735.5.5 Identify geometric lines used in hair shaping.
1735.5.6 Identify open and closed ends of a shaping.
1735.5.7 Arrange in order the steps for establishing a natural part in hair.
1735.5.8 Arrange in order the steps to finding natural hair growth direction.
1735.5.9 Select from a list rules to observe when making shaping.
1735.5.10 Section head into five styling sections.
1735.5.11 Make a shaping.
1735.5.12 Make a wave.
1735.5.13 Make a C-shape.

Standard 6: Demonstrate the ability to form pin curls. (1735.S.6)

Pin Curls Objectives
Students will:
1735.6.1 Match terms associated with pin curls to the correct definitions.
1735.6.2 Identify parts of a pin curl.
1735.6.3 Match parts of a pin curl to the correct functions.
1735.6.4 Identify types of pin curl stems.
1735.6.5 Match types of pin curl stems to the correct functions.
1735.6.6 Compare pin curl stems in relation to the pick-up line.
1735.6.7 Identify types of pin curls.
1735.6.8 Match types of pin curls to the correct functions.
1735.6.9 Identify bases used in forming a pin curl.
1735.6.10 Match bases used in forming a pin curl to the correct functions.
1735.6.11 Identify implements used to form a pin curl.
1735.6.12 Match implements used to form a pin curl to the correct functions.

1735.6.13 Select from a list rules to observe while forming a pin curl.
1735.6.14 Place sculpture curls in a shaping.
1735.6.15 Place stand up curls for volume.
1735.6.16 Form flare curls.
1735.6.17 Place ridge curls in set.
1735.6.18 Place curved or C-based curls in a shaping.
1735.6.19 Form a skip wave.
1735.6.20 Complete a basic set using various types of pin curls.

Standard 7: Demonstrate the ability to set hair using various roller techniques. (1735.S.7)

Roller Techniques Objectives
Students will:
1735.7.1 Match terms associated with roller sets to the correct definitions.
1735.7.2 Identify implements used in roller sets.
1735.7.3 Match implements used in roller sets to the correct functions.
1735.7.4 Identify parts of a roller curl.
1735.7.5 Match parts of a roller curl to the correct descriptions.
1735.7.6 Locate roller bases.
1735.7.7 Match roller diameters to the correct descriptions.
1735.7.8 Distinguish between volume and indentation.
1735.7.9 Identify various hair partings.
1735.7.10 Match various hair partings.
1735.7.11 Discuss various roller placements.
1735.7.12 Name products used in roller sets.
1735.7.13 State sanitary measures to observe during roller sets.
1735.7.14 State rules to observe during roller sets.
1735.7.15 Place rollers for a half-bang.
1735.7.16 Place rollers for a forward side.
1735.7.17 Place rollers for a wave side.
1735.7.18 Place rollers in back for basic set.
1735.7.19 Place vertical rollers in back to create design and wave pattern.

Standard 8: Apply the knowledge and skill of finger waving principles. (1735.S.8)

Finger Waving Principles Objectives
Students will:
1735.8.1 Match terms associated with finger waving to the correct definitions.
1735.8.2 Identify equipment and materials used in finger waving.
1735.8.3 Explain hair growth directions.
1735.8.4 Select from a list rules to observe during finger waving.
1735.8.5 Indicate the main characteristics of good finger waves.
1735.8.6 Demonstrate the ability to finger wave a full head of hair using a side part.

Standard 9: Demonstrate the ability to backcomb into a desired style. (1735.S.9)

Backcomb Objectives
Students will:
1735.9.1 Match terms associated with comb-outs to the correct definition.
1735.9.2 Identify equipment used in comb-outs.
1735.9.3 Match hairdressing fundamentals to the correct applications.
1735.9.4 Specify backcombing techniques.
1735.9.5 Describe sectional teasing.
1735.9.6 Detail common problems found when backcombing.
1735.9.7 Apply basic comb-out techniques.
1735.9.8 Backcomb hair.

1735.9.9 Lace hair.
1735.9.10 Back brush hair.
1735.9.11 Stretch a wave.

Standard 10: Demonstrate the ability to style hair using the thermal method. (1735.S.10)

Thermal Method Objectives
Students will:
1735.10.1 Match terms associated with thermal hairstyling to the correct definitions.
1735.10.2 Distinguish between soft press and hard press.
1735.10.3 Define hair texture.
1735.10.4 Distinguish between elasticity and porosity.
1735.10.5 Match types of scalps to the problems that might occur during thermal hairstyling.
1735.10.6 Match equipment used in thermal work to the correct functions.
1735.10.7 Arrange in order the steps to follow when tempering thermal irons.
1735.10.8 State factors to consider when determining the degree of heat to be used when thermal hairstyling.
1735.10.9 Recall how to clean the thermal irons.
1735.10.10 Match types of hair presses to the correct definitions.
1735.10.11 Match types of thermal curling to the proper characteristics.
1735.10.12 Select from a list problem areas to observe while thermal hairstyling.
1735.10.13 Select from a list safety precautions to observe while thermal hairstyling.
1735.10.14 Give a soft perm.
1735.10.15 Thermal curl hair.
1735.10.16 Thermal wave hair.
1735.10.17 Make side flare, sculpture, spiral (poker), and flip curls using the thermal method.

Standard 11: Demonstrate the knowledge needed to air wave hair. (1735.S.11)

Air wave Hair Objectives
Students will:
1735.11.1 Match terms associated with air waving to the correct definitions.
1735.11.2 Identify implements and equipment used in air waving.
1735.11.3 Match implements and equipment used in air waving to the correct functions.
1735.11.4 Note products used in air waving.
1735.11.5 Arrange in order the steps to air wave hair.
1735.11.6 Recall safety precautions to observe while air waving hair.
1735.11.7 Air wave hair using blow dryer and round brush.
1735.11.8 Use curling iron to style hair.
1735.11.9 Use hot comb to style hair.
1735.11.10 Curl hair using spring-control curling iron.

Standard 12: Apply knowledge and skill of hair shaping. (1735.S.12)

Hair Shaping Objectives
Students will:
1735.12.1 Match terms associated with haircutting and shaping to the correct definitions.
1735.12.2 Identify implements and equipment needed to give a haircut or shaping.
1735.12.3 Match implements and equipment needed to give a haircut or shaping to the proper functions.
1735.12.4 Identify the parts of a pair of scissors.
1735.12.5 Identify the parts of a razor.
1735.12.6 Identify the parts of a pair of thinning shears.
1735.12.7 Match the common names for head shapes to the technical names.
1735.12.8 Compare hair texture as it relates to haircutting and shaping.
1735.12.9 Distinguish between low and high elevation haircutting and shaping.

1735.12.10 Select from a list purposes for sectioning hair for a haircut or shaping.
1735.12.11 Distinguish between length and perimeter in haircutting and shaping.
1735.12.12 Distinguish between tapering and thinning the hair.
1735.12.13 Recall in order, steps for cutting and shaping hair to the bond structure.
1735.12.14 Distinguish between beveling with a razor and tapering shears.
1735.12.15 Identify various elevations used in haircutting and shaping.

Standard 13: Demonstrate knowledge and skill in wiggery. (1735.S.13)

Wiggery Objectives
Students will:
1735.13.1 Match terms associated with hairpieces to the correct definitions.
1735.13.2 Match types of wig materials to the correct descriptions.
1735.13.3 Repeat federal government requirements for labeling hairpieces.
1735.13.4 Identify types of hairpieces.
1735.13.5 Match hairpieces to the correct method of construction.
1735.13.6 Identify implements and equipment used for styling hairpieces.
1735.13.7 List the steps in measuring the head to fit a wig.
1735.13.8 Recall methods of sizing and blocking a wig.
1735.13.9 Distinguish between products for cleaning hairpieces.
1735.13.10 Arrange in order the steps for cleaning a hairpiece.
1735.13.11 Style a wiglet.
1735.13.12 Style a wig.

Standard 14: Apply the principles of permanent waving. (1735.S.14)

Permanent Weaving Objectives
Students will:
1735.14.1 Examine and analyze clients hair and scalp.
1735.14.2 Identify clients preparation prior to perm.
1735.14.3 Demonstrate a shaping on client.
1735.14.4 Section and block the head in a straight back pattern.
1735.14.5 Section and block the head in a double halo pattern.
1735.14.6 Section and block the head in a dropped crown position.
1735.14.7 Select rods, section and subsection head, wrap off-base curls.
1735.14.8 Select rods, section and subsection head, wrap off-base curls.
1735.14.9 Select rods, section and subsection head, wrap half-base curls.
1735.14.10 Wrap hair with single end paper.
1735.14.11 Wrap hair with double end paper.
1735.14.12 Wrap hair with book end paper.
1735.14.13 Identify choice of waving lotion and apply.
1735.14.14 Develop test curls.
1735.14.15 Application of neutralizer-direct method.
1735.14.16 Application of neutralizer-splash on method.
1735.14.17 Develop piggyback wrap for long hair.
1735.14.18 Develop a body permanent.
1735.14.19 Give acid-balanced permanent wave using preheated dryer.

Standard 15: Demonstrate the ability to give a chemical hair relaxer. (1735.S.15)

Chemical Hair Relaxer Objectives
Students will:
1735.15.1 Match terms associated with chemical relaxing to the correct definitions.
1735.15.2 Distinguish between hair density and hair texture.
1735.15.3 Distinguish between elasticity and porosity.
1735.15.4 Identify the structure of the hair.

1735.15.5 Describe the parts of the hair structure.
1735.15.6 Match products used in the chemical relaxing process to their correct descriptions.
1735.15.7 Recall methods of applying chemical relaxer to the hair.
1735.15.8 Itemize implements used for chemical relaxing.
1735.15.9 Arrange in order the steps for taking a strand test.
1735.15.10 Select from a list safety precautions to observe during the chemical relaxing process.
1735.15.11 Arrange in order the steps for a chemical relaxer.
1735.15.12 Arrange in order the steps for a relaxer retouch.
1735.15.13 Arrange in order the steps for a chemical blow-out.
1735.15.14 Complete a record chart.
1735.15.15 Determine the proper chemical relaxer and procedure to follow when given a specific situation.
1735.15.16 Section hair for a chemical relaxer.
1735.15.17 Straighten hair using a thio chemical relaxer.
1735.15.18 Straighten hair using a sodium hydroxide (caustic) relaxer.

Standard 16: Demonstrate knowledge and skill in hair coloring. (1735.S.16)

Hair Coloring Objectives
Students will:
1735.16.1 Match terms associated with hair coloring to the correct definitions.
1735.16.2 Describe hair structure as it relates to hair coloring.
1735.16.3 List types of hair coloring products.
1735.16.4 Match hair coloring products to the general coloring characteristics.
1735.16.5 Arrange in order the steps in performing a predisposition test.
1735.16.6 List the primary and secondary colors.
1735.16.7 Distinguish between warm and cool colors.
1735.16.8 Distinguish between single application and double application services.
1735.16.9 Distinguish between shades and stages of hair coloring.
1735.16.10 Describe nonprofessional hair color products.
1735.16.11 Distinguish between henna and soap cap.
1735.16.12 Demonstrate different methods to apply color fillers.
1735.16.13 Demonstrate pre-softening of hair.
1735.16.14 Describe the effect of oxidation in hair coloring.
1735.16.15 Select from a list information included on a hair color chart.
1735.16.16 Label hair care products used after coloring.
1735.16.17 Select from a list corrective measures for hair color problems.
1735.16.18 Formulate information necessary for completing a record card.
1735.16.19 Recall safety precautions to observe during hair coloring.
1735.16.20 Correct hair color problems.
1735.16.21 Apply a virgin tint darker than natural hair color.
1735.16.22 Apply a tint retouch.
1735.16.23 Apply color for lighter shade (single application).
1735.16.24 Apply instant temporary color.
1735.16.25 Apply semi-permanent color.

Standard 17: Demonstrate knowledge of skill of hair lightening. (1735.S.17)

Hair Lightening Objectives
Students will:
1735.17.1 Match terms associated with lightening and toning to the correct definitions.
1735.17.2 Match hair structures as they relate to lightening and toning to the correct descriptions.
1735.17.3 Define hair porosity.
1735.17.4 Match lightening and toning products to the general lightening characteristics.
1735.17.5 Repeat the stages of hair lightening.
1735.17.6 Distinguish between shades and stages of hair coloring.

1735.17.7 Recall primary and secondary colors.
1735.17.8 Select from a list color rules to observe during lightening and toning.
1735.17.9 Distinguish between warm and cool colors.
1735.17.10 Connect hydrogen peroxide as a developer for tints and lighteners.
1735.17.11 Distinguish between a virgin lightener and a lightener retouch.
1735.17.12 Select from a list the proper ways of selecting a toner color.
1735.17.13 Indicate the chemical composition of penetrating products used in lightening and toning.
1735.17.14 Distinguish between color lifting and color grabbing.
1735.17.15 Arrange in order the steps for giving a predisposition test.

Orientation to Cosmetology

This course will provide the student with information about the future of the cosmetology field, sanitation practices and salon equipment.

Standard 1: Summarize the occupational outlook of cosmetology. (1737.S.1)

Cosmetology Objectives
Students will:
1737.1.1 Match terms associated with orientation to the correct definitions.
1737.1.2 Discuss facts concerning the occupational outlook of cosmetology.
1737.1.3 Identify various types of occupations that can be acquired through cosmetology training.
1737.1.4 Select from a list specific areas involved in cosmetology lab work.
1737.1.5 Select from a list student requirements for the cosmetology program.

Standard 2: Identify general implements and equipment used in a salon. (1737.S.2)

Salon Objectives
Students will:
1737.2.1 Match terms associated with implements and equipment to the correct definitions.
1737.2.2 Identify types of combs.
1737.2.3 Identify types of brushes.
1737.2.4 Identify types of rollers
1737.2.5 Identify types of clips.
1737.2.6 Identify air-waving equipment (quick service).
1737.2.7 Identify haircutting implements.
1737.2.8 Identify equipment used for facials and scalp treatments.
1737.2.9 Identify implements used in thermal waving.
1737.2.10 Identify implements used in permanent waving.
1737.2.11 Identify implements used in hair lightening and hair coloring.
1737.2.12 Identify manicure and pedicure implements.
1737.2.13 Identify implements used in styling hairpieces.
1737.2.14 Identify implements and equipment used shampooing.
1737.2.15 Identify drying equipment.
1737.2.16 Identify implements and equipment used in hairstyling.
1737.2.17 Distinguish between wet and dry sanitizers.

Standard 3: Demonstrate knowledge of rules concerning sanitation and safety. (1737.S.3)

Sanitation and Safety Objectives
Students will:
1737.3.1 Match terms associated with safety to the correct definitions.
1737.3.2 Match the colors of the safety color code with their correct use.
1737.3.3 Identify rules for personal safety.
1737.3.4 Select from a list sanitation and sterilization rules that can prevent some personal safety hazards.
1737.3.5 Select physical and chemical methods of sterilization.
1737.3.6 Arrange in order steps for using a wet sanitizer.
1737.3.7 Identify how bacteria can become a personal health hazard.
1737.3.8 Distinguish between pathogenic and nonpathogenic bacteria.
1737.3.9 Match types of pathogenic bacteria to diseases they cause.
1737.3.10 Select rules for general shop safety.
1737.3.11 Label the components of the fire triangle.
1737.3.12 Match the classes of fire to the correct definitions.
1737.3.13 Match types of fire extinguishers to the class of fire each is best suited to extinguish.

1737.3.14 Complete a safety pledge form.
1737.3.15 Complete a safety inspection checklist.
1737.3.16 State general shop safety rules.
1737.3.17 Recall sanitation rules.

Professional Practices – Skin and Nails

This course will provide the student with the knowledge and skills to be able to provide manicures, pedicures, massage, facials, apply full makeup and various methods of hair removal.

Standard 1: Demonstrate knowledge of manicuring and pedicuring. (1739.S.1)

Manicuring and Pedicuring Objectives
Students will:
1739.1.1 Match terms associated with manicuring and pedicuring to the correct definitions.
1739.1.2 Identify the most common shapes for manicuring women's nails.
1739.1.3 Identify the most common shapes for manicuring men's nails.
1739.1.4 Match supplies used in manicuring and pedicuring with the correct functions.
1739.1.5 Identify equipment and implements used in manicuring and pedicuring.
1739.1.6 Match implements and equipment to their correct functions.
1739.1.7 Distinguish between a regular manicure and a man's manicure.
1739.1.8 Describe hot oil manicuring.
1739.1.9 Identify disorders of the nail.
1739.1.10 Match disorders of the nail to the correct cause.
1739.1.11 Identify diseases of the nail.
1739.1.12 Match diseases with their symptoms and causes.
1739.1.13 Select from a list the safety precautions to observe while giving a manicure or pedicure.
1739.1.14 Name sanitary measures to observe while giving a manicure and pedicure.
1739.1.15 Arrange implements and materials for a manicure and pedicure.
1739.1.16 Give a regular manicure.
1739.1.17 Apply liquid polish.
1739.1.18 Give a hot oil manicure.
1739.1.19 Give a pedicure.
1739.1.20 Repair split or broken nails.
1739.1.21 Apply plastic nails.
1739.1.22 Apply sculpture nails.
1739.1.23 Apply brush-on nails.
1739.1.24 Give a man's manicure.

Standard 2: Identify various structures and functions of the nail. (1739.S.2)

Nail Objectives
Students will:
1739.2.1 Match terms associated with nail structure to the correct definitions.
1739.2.2 Identify parts of the nail.
1739.2.3 Match parts of the nail to the correct functions.
1739.2.4 Identify various shapes of nail growth.
1739.2.5 Name characteristics of nail growth.

Standard 3: Illustrate knowledge of massage. (1739.S.3)

Massage Objectives
Students will:
1739.3.1 Match terms associated with massage manipulations to the correct definitions.
1739.3.2 Signify the effects of massage.
1739.3.3 Identify various types of massage.
1739.3.4 Match types of massage manipulations to the correct characteristics.
1739.3.5 Explain safety precautions to observe while applying massage manipulations.

Standard 4: Demonstrate the ability to give a facial. (1739.S.4)

Facial Objectives
Students will:
1739.4.1 Match terms associated with facials to their correct definitions.
1739.4.2 Match the structures of the skin to the correct functions.
1739.4.3 Identify muscle and nerve motor points of the face.
1739.4.4 Develop reasons for giving facials.
1739.4.5 Match skin disorders and diseases to the correct descriptions.
1739.4.6 Match types of primary lesions to the correct descriptions.
1739.4.7 Match types of secondary lesions to the correct descriptions.
1739.4.8 Match the products used in giving a facial to the correct definitions.
1739.4.9 Distinguish between facial packs and facial masks.
1739.4.10 Identify implements and equipment used in giving a facial.
1739.4.11 Match implements and equipment used in giving a facial to the correct functions.
1739.4.12 State the types of skin problems that require a facial.
1739.4.13 Select proper treatment for skin conditions that require a facial.
1739.4.14 Arrange in order the steps in giving a plain facial.
1739.4.15 Mark sanitary measures to observe while giving a facial.
1739.4.16 State safety precautions to observe while giving a facial.
1739.4.17 Complete a safety precaution checklist.
1739.4.18 Drape patron for a facial.
1739.4.19 Give a plain facial.
1739.4.20 Apply facial mask and pack.
1739.4.21 Give facial manipulations.
1739.4.22 Arch the eyebrows.

Standard 5: Demonstrate the ability to apply full makeup. (1739.S.5)

Makeup Objectives
Students will:
1739.5.1 Match terms associated with makeup to the correct definitions.
1739.5.2 Match cosmetics used in applying makeup to the correct characteristics.
1739.5.3 Identify facial shape.
1739.5.4 Identify facial problems.
1739.5.5 Proportion a face.
1739.5.6 Differentiate fair, dark, and oriental skin tones.
1739.5.7 Distinguish between daytime and evening makeup.
1739.5.8 Match facial shapes and features to problem areas needing correctional makeup.
1739.5.9 Note procedures needed to correct various facial problem areas.
1739.5.10 Arrange in order the steps to applying daytime makeup.
1739.5.11 Distinguish between strip lashes and individual lashes.
1739.5.12 Arrange in order the steps for cleaning strip lashes.
1739.5.13 Select from a list sanitary measures to observe while applying makeup.
1739.5.14 Find safety precautions to observe while applying makeup.
1739.5.15 Apply daytime makeup.
1739.5.16 Apply evening makeup.
1739.5.17 Apply corrective makeup.
1739.5.18 Apply strip lashes.
1739.5.19 Apply individual lashes.

Standard 6: Demonstrate knowledge of various methods of hair removal. (1739.S.6)

Hair Removal Objectives
Students will:
1739.6.1 Match terms associated with hair removal to the correct definitions.

1739.6.2 Describe the types of hair removal.
1739.6.3 Choose methods of permanent hair removal.
1739.6.4 Itemize methods of temporary hair removal.
1739.6.5 Identify implements used in temporary hair removal.
1739.6.6 Match products and implements to the correct functions.
1739.6.7 Select from a list safety precautions to observe while temporarily removing hair.
1739.6.8 Tweeze eyebrow hair.
1739.6.9 Apply wax depilatory.
1739.6.10 Apply chemical depilatory.

Diesel Engine Components

This course will introduce students to the fundamentals of engine components used in diesel equipment technology.

Standard 1: Demonstrate knowledge of cylinder head components and service. (1741.S.1)

Cylinder Head Components and Service Objectives
Students will:
1741.1.1 Define terms and major parts associated with a cylinder head assembly.
1741.1.2 Disassemble, service and assemble a cylinder head and components.

Standard 2: Demonstrate knowledge of piston and connecting rod assemblies. (1741.S.2)

Piston and Connecting Rod Assemblies Objectives
Students will:
1741.2.1 Define terms and major parts associated with piston and connecting rod assemblies.
1741.2.2 Identify types of pistons and piston rings, and list their functions.
1741.2.3 Disassemble, service, measure for wear and assemble piston and connecting assembly.

Standard 3: Demonstrate knowledge and skill in the operation of timing gears. (1741.S.3)

Timing Gears Objectives
Students will:
1741.3.1 Define terms and major parts associated with camshafts, gears and the valve train.
1741.3.2 Explain valve timing on a two-cycle and four-cycle engine.
1741.3.3 Describe gears found in a typical gear train and identify those that are marked to insure correct valve timing.
1741.3.4 Remove, service and install a camshaft.

Standard 4: Demonstrate knowledge of cylinder blocks. (1741.S.4)

Cylinder Blocks Objectives
Students will:
1741.4.1 Define terms and major parts associated with cylinder blocks and a typical frame design.
1741.4.2 Identify advantages of a removable liner over an integral cylinder bore.
1741.4.3 Remove, inspect and install a cylinder liner.
1741.4.4 Clean, inspect, pressure test, service, repair and replace components of an engine block.

Standard 5: Demonstrate knowledge of crankshafts. (1741.S.5)

Crankshafts Objectives
Students will:
1741.5.1 Define terms and major parts associated with crankshafts and bearings.
1741.5.2 Describe the effects of the arrangement of crankshaft throws, and how the arrangement of throws relates to the number of cylinders in the engine.
1741.5.3 Identify ways crankshaft balance is maintained.
1741.5.4 Clean, inspect, service and repair crankshafts, oil passages; passage plugs, and journal.

Standard 6: Demonstrate knowledge of common types of bearings and seals. (1741.S.6)

Bearings and Seals Objectives

Students will:

1741.6.1 Define terms and major parts associated with bearings and seals.

1741.6.2 Discuss the advantages and disadvantages of various types of bearings.

1741.6.3 Identify common methods of lubricating bearings, and causes of bearing failure.

1741.6.4 Identify types of anti-friction, ball, roller, and needle bearings.

1741.6.5 Remove and install a plain bearing and an anti-friction bearing; check and reload bearing setting, using spring scale methods.

1741.6.6 Identify places where dynamic seals are used.

Diesel Engine Tune Up and Troubleshooting

This course will introduce students to the fundamentals of tune up and troubleshooting used in diesel equipment technology.

Standard 1: Diagnose engine problems and prepare for engine testing. (1743.S.1)

Engine Objectives
Students will:
1743.1.1 Define terms associated with operation and maintenance.
1743.1.2 List inspections to include in a checklist during normal operation.
1743.1.3 List factors to include in the procedure for stopping a diesel engine.
1743.1.4 Match the causes of an engine misfiring with the corrective actions.
1743.1.5 Identify causes of engine knock.
1743.1.6 Identify causes of an overheated engine.
1743.1.7 Identify four causes of smoky exhaust.

Standard 2: Demonstrate knowledge of tune-up/adjustment of a diesel engine. (1743.S.2)

Tune-up/Adjustment of A Diesel Engine Objectives
Students will:
1743.2.1 Define terms associated with tune-up and adjustment.
1743.2.2 Identify major items to include in a visual inspection checklist.
1743.2.3 Tune-up a Cummins diesel engine.
1743.2.4 Tune-up a Detroit diesel engine.
1743.2.5 Tune-up a 3400 series Caterpillar diesel engine.

Standard 3: Demonstrate knowledge of troubleshooting a diesel engine. (1743.S.3)

Diesel Engine Objectives
Students will:
1743.3.1 Match terms associated with diagnosis and testing of engines with the correct definitions.
1743.3.2 Arrange in order the steps in diagnosing and testing an engine.
1743.3.3 Identify major checkpoints when inspecting a diesel engine.
1743.3.4 Complete a list of major checks to make when operating an engine.
1743.3.5 Identify factors necessary for an engine to produce horsepower.
1743.3.6 Select the possible causes of a diesel engine being hard to start or not starting.
1743.3.7 Select the possible causes of a diesel engine starting but not running.
1743.3.8 Identify items which cause a diesel engine to misfire.
1743.3.9 Select items which cause a diesel engine to knock.
1743.3.10 Select the items which cause a diesel engine to overheat.
1743.3.11 Identify items which cause a diesel engine to have lack of power.
1743.3.12 Select the items which cause a diesel engine to use too much oil.
1743.3.13 Identify causes of high oil pressure.
1743.3.14 List causes of low oil pressure.

Diesel Preventative Maintenance and Inspection

This course will introduce students to the fundamentals of medium and heavy truck preventative maintenance & inspection used in diesel equipment technology.

Standard 1: Demonstrate knowledge of the engine systems maintenance. (1745.S.1)

Engine Systems Objectives
Students will:
1745.1.1 Check engine components
1745.1.2 Check engine operation
1745.1.3 Inspect the fuel system
1745.1.4 Inspect air induction and exhaust system
1745.1.5 Inspect cooling system
1745.1.6 Inspect the lubrication system

Standard 2: Demonstrate knowledge of under hood and cab maintenance. (1745.S.2)

Hood and Cab Maintenance Objectives
Students will:
1745.2.1 Inspect instruments and controls
1745.2.2 Inspect safety equipment
1745.2.3 Inspect hardware
1745.2.4 Inspect heating and AC system

Standard 3: Demonstrate knowledge of electrical/electronic systems. (1745.S.3)

Electrical/Electronic Systems Objectives
Students will:
1745.3.1 Inspect battery and starting system
1745.3.2 Inspect charging system
1745.3.3 Inspect lighting system

Standard 4: Demonstrate knowledge of frame and chassis maintenance. (1745.S.4)

Frame and Chassis Maintenance Objectives
Students will:
1745.4.1 Inspect air brake system
1745.4.2 Inspect drive train
1745.4.3 Inspect steering and suspension system
1745.4.4 Inspect tires and wheels
1745.4.5 Inspect frame and 5th wheel

Diesel Support Systems

This course will introduce students to the fundamentals of support systems used in diesel equipment technology.

Standard 1: Demonstrate knowledge of lubrication and cooling systems. (1747.S.1)

Lubrication and Cooling Systems Objectives
Students will:
1747.1.1 Match terms associated with the cooling system with the correct definitions.
1747.1.2 Identify two functions of the cooling system and the effects of an engine running too hot or too cold.
1747.1.3 Identify the parts in an air cooling system.
1747.1.4 Identify types of radiators and functions of the radiator cap.
1747.1.5 Identify three types of fans used in cooling systems and types of gauges.
1747.1.6 Identify purpose for using coolant filter or conditioner in a cooling system.
1747.1.7 Select function of the thermostat.
1747.1.8 Identify the primary parts of a water pump and fan.
1747.1.9 Match terms associated with the lubrication system with the correct definitions.
1747.1.10 Identify types of lubrication systems and their components.
1747.1.11 Identify two types of oil filters and sources of oil contamination.
1747.1.12 Identify types of oil pumps.
1747.1.13 Identify purposes of lubricating valves.
1747.1.14 Distinguish between internally and externally mounted oil coolers.

Standard 2: Demonstrate knowledge of air intake and exhaust systems. (1747.S.2)

Air Intake and Exhaust Systems Objectives
Students will:
1747.2.1 Match terms and definitions of an air intake and exhaust system and name the parts of each system.
1747.2.2 Match types of air cleaners with their processes.
1747.2.3 Identify methods of scavenging the cylinders on a two-stroke cycle engine.
1747.2.4 Identify advantages of a turbo charged engine.
1747.2.5 Test an engine for air flow restriction.
1747.2.6 Inspect a turbo charger for satisfactory operation.

Standard 3: Demonstrate knowledge of starting and charging systems. (1747.S.3)

Starting and Charging Systems Objectives
Students will:
1747.3.1 Match terms and definitions of a starting system and identify major types of systems.
1747.3.2 Name components of an electric starting system.
1747.3.3 List low temperature starting aids.
1747.3.4 Match terms associated with charging system and name it's components.
1747.3.5 Test output of alternators on and off of vehicle.

Standard 4: Demonstrate knowledge of engine retarders. (1747.S.4)

Engine Retarders Objectives
Students will:
1747.4.1 Match terms related to engine brakes and retarders with the correct definitions.
1747.4.2 Identify advantages of the Jacobs engine brake.

Standard 5: Demonstrate knowledge of fuel system components. (1747.S.5)

Fuel System Objectives

Students will:

1747.5.1 Match terms related to fuel injection systems with their correct definitions.

1747.5.2 Identify types and major functions of fuel injection systems.

1747.5.3 Match terms and definitions related to fuel system components and the parts of a fuel system with their functions.

1747.5.4 Identify fuel tank maintenance problems.

1747.5.5 Match types of fuel lines with their purposes.

1747.5.6 Identify the purpose of a fuel transfer pump.

1747.5.7 Identify types and characteristics of fuel filters and separators used for a fuel filtration system.

Standard 6: Demonstrate knowledge of governor. (1747.S.6)

Governor Objectives

Students will:

1747.6.1 Match terms related to governors with their correct definitions and the purposes of a governor.

1747.6.2 Identify basic types of governors using flyweights.

Diesel Truck Chassis Concepts

This course will introduce students to the fundamentals of heavy truck chassis used in diesel equipment technology.

Standard 1: Demonstrate knowledge of transmissions, clutches and drive lines. (1749.S.1)

Transmissions, Clutches and Drive Lines Objectives
Students will:

1749.1.1 Remove and replace automatic and manual transmissions.
1749.1.2 Remove and replace single-plate and two-plate clutch (transmission removed).
1749.1.3 Replace flywheel drive lugs for two-plate clutch.
1749.1.4 Align engine flywheel housing.
1749.1.5 Inspect pressure plate for reuse, remove and replace clutch release bearing and replace pilot bearing.
1749.1.6 Rebuild 4 or 5 speed manual transmission for medium-duty truck.
1749.1.7 Remove and replace transmission for air shift mechanisms and rebuild air shift mechanism.
1749.1.8 Overhaul twin counter shaft and three counter shaft transmissions.
1749.1.9 Replace transmission input shaft separate from transmission overhaul.
1749.1.10 Replace speedometer drive gear separate from transmission overhaul.
1749.1.11 Remove and replace shift lever housing from transmission separate from transmission overhaul.
1749.1.12 Rebuild shift lever housing.
1749.1.13 Remove and reinstall driveline.
1749.1.14 Set and replace universal joints.
1749.1.15 Remove and replace yoke (driveline removed).
1749.1.16 Remove and replace driveline center bearings.
1749.1.17 Remove, rebuild and replace rear differential carrier assembly in tandem.
1749.1.18 Remove, rebuild and reinstall front differential carrier assembly in tandem.
1749.1.19 Remove, rebuild and reinstall interaxle differential.
1749.1.20 Replace pinion seal separate from carrier overhaul.
1749.1.21 Remove and reinstall two-speed shift unit.

Standard 2: Demonstrate knowledge of steering, suspensions, tires/wheels. (1749.S.2)

Steering, Suspensions, Tires/Wheels Objectives
Students will:

1749.2.1 Lubricate steering and suspension components.
1749.2.2 Check and correct power steering belt tension and correct power steering fluid level.
1749.2.3 Replace tie rod ends.
1749.2.4 Replace center link and idler cam.
1749.2.5 Diagnose steering and suspension problems.
1749.2.6 Set toe-in to manufacturer specifications.
1749.2.7 Remove and replace king pin and bushings.
1749.2.8 Service wheel bearings and seals.
1749.2.9 Repair or rebuild spring assembly and shackles, hangers, and pads.
1749.2.10 Remove and replace torque arm bushing.
1749.2.11 Inspect tires, identify tire, rim, type, and size and match new tire for replacement.
1749.2.12 Recognize causes and remedies of abnormal tire wear.
1749.2.13 Inspect and replace wheel assembly, measure run out, out of roundness, and inspect for flaws.
1749.2.14 Diagnose tire and wheel malfunction.

Standard 3: Demonstrate knowledge of the air brake system. (1749.S.3)

Air Brake Systems Objectives

Students will:

1749.3.1 Inspect brake lines for condition and leaks.
1749.3.2 Service drums, calipers, and rotors.
1749.3.3 Test and diagnose air brake system.
1749.3.4 Remove and replace various air system components.
1749.3.5 Service air brake system plumbing.
1749.3.6 Remove and replace service brake chamber diaphragm.
1749.3.7 Adjust brakes.
1749.3.8 Remove and replace brake shoes.
1749.3.9 Remove and replace spring brake chambers.
1749.3.10 Remove, replace, and adjust air governor.
1749.3.11 Repair, replace, or adjust air pressure relief valve.
1749.3.12 Rebuild air compressors and governors.

Fundamentals of Diesel Equipment Technology

This course will introduce students to the fundamentals of diesel equipment technology. Students will become familiar with the proper use of hand and power tools, precision measurement, and basic oxyacetylene welding and electric welding; identify, tear down, clean, inspect and rebuild various components of an engine.

Standard 1: Identify, explore, and evaluate career opportunities related to diesel equipment technology. (1751.S.1)

Diesel Equipment Technology Objectives
Students will:
1751.1.1 Describe a variety of careers related to diesel equipment technology, and the training necessary to be successful in those careers.
1751.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of diesel equipment technology.
1751.1.3 Identify sources of information about careers in diesel equipment technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to diesel equipment technology. (1751.S.2)

Basic Safety Rules and Equipment Objectives
Students will:
1751.2.1 Recognize and follow general safety guidelines, including the selection and use of protective equipment and fire extinguishers.
1751.2.2 Describe safety precautions necessary when using hazardous materials.
1751.2.3 Describe the precautions to be taken when welding in confined areas.

Standard 3: Identify basic hand tools used in diesel equipment technology and perform various operations. (1751.S.3)

Basic Hand Tools Objectives
Students will:
1751.3.1 Choose the proper hand tools for given applications and describe the proper care and maintenance of each.
1751.3.2 Demonstrate adjustments necessary with each tool.
1751.3.3 Drill holes with a drill press.
1751.3.4 Read micrometer and venire micrometer settings.
1751.3.5 Select tools used to restore external and internal threads.

Standard 4: Demonstrate knowledge of fasteners. (1751.S.4)

Fasteners Objective
Students will:
1751.4.1 Identify typical fasteners, including washers, devices for locking nuts or bolts, and common types of snap rings and use them in given applications.

Standard 5: Demonstrate knowledge of basic diesel test equipment. (1751.S.5)

Basic Diesel Test Equipment Objective
Students will:
1751.5.1 Identify and use various types of test equipment and service tools.

Standard 6: Demonstrate knowledge of the principles of two and four stroke cycle engine operation. (1751.S.6)

Cycle Engine Operation Objectives

Students will:

1751.6.1 Review the operation of a two stroke and four stroke engine.

1751.6.2 Identify basic parts of a diesel engine.

Standard 7: Demonstrate knowledge of diesel fuel, engine lubricating oils, and coolants. (1751.S.7)

Diesel Fuel, Engine Lubricating Oils, and Coolants Objectives

Students will:

1751.7.1 Define terms and grades associated with diesel fuels, lubricants and coolants meeting ASTM standards.

1751.7.2 List four functions of engine oil and engine oil additives.

1751.7.3 Identify oil contaminants.

1751.7.4 Identify types of cooling systems used on modern engines.

1751.7.5 Explain the function of the parts of a liquid cooling system.

1751.7.6 Identify requirements of a good antifreeze.

Basic Electronics

This course will introduce students to the analysis of basic AC and DC circuits, electronic devices, and basic electronic circuits.

Standard 1: Analyze basic DC and AC circuits. (1761.S.1)

DC and AC Circuits Objectives
Students will:
1761.1.1 Explain the purpose of resistors and resistive circuits.
1761.1.2 Solve electronic problems using Ohm's Law and power formulas.
1761.1.3 Construct and analyze series, parallel, and combination resistive circuits.
1761.1.4 Demonstrate knowledge of voltage and current dividers.
1761.1.5 Demonstrate AC and DC test equipment usage.
1761.1.6 Utilize Kirchoff's Laws to solve multi-source circuits.
1761.1.7 Demonstrate knowledge of network theorems.
1761.1.8 Demonstrate knowledge of magnetism, magnetic units, and electro-magnetic induction.
1761.1.9 Construct and analyze AC and DC circuits.
1761.1.10 Solve for inductance and inductive reactance.
1761.1.11 Solve for capacitance and capacitive reactance.
1761.1.12 Construct timing circuits and solve for time constants.
1761.1.13 Solve for resonance and resonant circuit parameters.
1761.1.14 Construct various filter circuits.

Standard 2: Identify and use electronic devices. (1761.S.2)

Electronic Devices Objectives
Students will:
1761.2.1 Describe semiconductor materials.
1761.2.2 Explain the PN junction.
1761.2.3 Explain semiconductor diode construction and operation.
1761.2.4 Describe PNP and NPN transistor operation.
1761.2.5 Explain Field-Effect Transistor (FET) operation.
1761.2.6 Use thyristors for voltage control devices.
1761.2.7 Cross-reference semiconductor type numbers and case styles.
1761.2.8 Use special purpose diodes and analyze their operation.
1761.2.9 Explain visual character displays.
1761.2.10 Demonstrate testing of diodes, transistors, and thyristors.

Standard 3: Construct electronic circuits. (1761.S.3)

Electronic Circuits Objectives
Students will:
1761.3.1 Illustrate analog and digital signals.
1761.3.2 Calculate amplifier gains.
1761.3.3 List and explain characteristics of amplifier circuits.
1761.3.4 Construct amplifiers and observe their outputs.
1761.3.5 Construct oscillators and observe their outputs.
1761.3.6 Construct multivibrators and observe their outputs.
1761.3.7 Explain modulation of amplitude, frequency, and pulse-code.
1761.3.8 Construct diode and I.C. rectifiers and compare them to I.C. rectifiers.
1761.3.9 Troubleshoot power supplies.
1761.3.10 Describe circuit configuration for various amplifier systems.

1761.3.11 Explain class A, B and C operation of amplifier.
1761.3.12 Give analysis of the Common-Emitter (CE) amplifier configuration.
1761.3.13 Explain types of output distortion.
1761.3.14 Troubleshoot amplifier circuit inputs and outputs.
1761.3.15 Analyze inputs and outputs of OP-Amps.

Standard 4: Apply digital fundamentals to electronic circuits. (1761.S.4)

Electronic Circuits Objectives
Students will:
1761.4.1 Demonstrate knowledge of binary numbers and arithmetic.
1761.4.2 Demonstrate knowledge of octal numbers and arithmetic.
1761.4.3 Convert between numbering systems.
1761.4.4 Interpret logic diagrams.
1761.4.5 Draw symbols for basic logic gates.
1761.4.6 Construct basic logic gates from discrete components and I.C's and monitor their outputs.
1761.4.7 Construct and analyze basic logic circuits.

Fundamentals of Electricity

This course will introduce students to the fundamental skills related to electricity. Students will become familiar with the use of meters and other equipment used in the field of electricity, and learn how to construct a variety of circuits.

Standard 1: Identify, explore/evaluate career opportunities related to electricity. (1763.S.1)

Electricity Objectives
Students will:
1763.1.1 Describe a variety of careers related to electricity, and the training necessary to be successful in those careers.
1763.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of electricity.
1763.1.3 Identify sources of information about careers in electricity.

Standard 2: Demonstrate knowledge of electrical safety. (1763.S.2)

Electrical Safety Objectives
Students will:
1763.2.1 Describe the effect of current on the human body.
1763.2.2 List general safety precautions when working with electricity.
1763.2.3 Identify various types of safety devices used with electricity.
1763.2.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1763.2.5 List and describe the safe use of basic hand and power tools used in the field of electricity.

Standard 3: Interpret blueprints, schematics and technical orders. (1763.S.3)

Blueprints, Schematics and Technical Orders Objectives
Students will:
1763.3.1 Demonstrate knowledge of blueprint reading.
1763.3.2 Demonstrate knowledge of schematic reading.
1763.3.3 Explain the reasons for building plans and specifications.

Standard 4: Apply electrical math concepts. (1763.S.4)

Electrical Math Concepts Objectives
Students will:
1763.4.1 Demonstrate knowledge of Ohm's law and power formulas.
1763.4.2 Calculate branch circuit loads.

Standard 5: Demonstrate the proper use and care of electrical meters. (1763.S.5)

Electrical Meters Objective
Students will:
1763.5.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 6: Construct and analyze basic circuits.

Basic Circuits Objectives
Students will:
1763.6.1 Describe the electrical classification of conductors, insulators, and semi-conductors.

1763.6.2 Describe electrical current and differentiate between the different kinds of current.
1763.6.3 Define voltage, current, resistance, and power.
1763.6.4 List, and schematically represent the components that make up a basic electrical circuit.
1763.6.5 Connect dry cells into various series and parallel arrangements and measure and record voltage readings across each battery configuration.
1763.6.6 Conduct experiments that demonstrate the production of an electromotive force, obtaining voltage readings from experiments.
1763.6.7 Construct, solve and troubleshoot series, parallel and complex circuits.

Standard 7: Demonstrate proper techniques in making connections/wire splices. (1763.S.7)

Connections/Wire Splices Objectives
Students will:
1763.7.1 Properly remove insulation and make tap, pigtail and western union splices.
1763.7.2 Apply solderless terminals, wire nuts, and insulating tape to the ends of various sized wires.

Standard 8: Perform basic soldering techniques.

Basic Soldering Objectives
Students will:
1763.8.1 Demonstrate proper use and care for soldering tools and equipment.
1763.8.2 Demonstrate correct stripping, tinning, and soldering procedures.
1763.8.3 Identify characteristics of a good solder connection.

Industrial and Commercial Wiring

This course will introduce students to the special installation and characteristics of industrial and commercial wiring according to the National Electrical Code.

Standard 1: Install conduit and raceways. (1765.S.1)

Conduit and Raceways Objectives
Students will:
1765.1.1 List various types of conduit and their uses.
1765.1.2 List NEC code requirements for installation and construction of various conduit and raceway systems.

Standard 2: Maintain lighting and receptacle outlets. (1765.S.2)

Lighting and Receptacle Outlets Objectives
Students will:
1765.2.1 Explain and install emergency lighting systems.
1765.2.2 Diagnose and repair various lighting, receptacle and outlet problems.

Standard 3: Demonstrate knowledge of industrial grounding methods. (1765.S.3)

Industrial Grounding Method Objective
Students will:
1765.3.1 Explain grounding of single-phase and three-phase systems.

Standard 4: Demonstrate knowledge and skills associated with transformers. (1765.S.4)

Transformers Objectives
Students will:
1765.4.1 List safety procedures used when working with transformers.
1765.4.2 Describe construction and operating characteristics of transformers.
1765.4.3 Illustrate various types of transformer connections and discuss the results of these connections.
1765.4.4 Connect dual-voltage transformers for high and low voltage operation.

National Electrical Code

This course will introduce students to the National Electrical Code, and prepare them for the state license testing.

Standard 1: Demonstrate skills in the use of the National Electrical Code (NEC) Handbook. (1767.S.1)

National Electrical Code (NEC) Handbook Objectives
Students will:

1767.1.1 Explain history and purpose of the CODE (Article 90).
1767.1.2 Explain chapter layout of the NEC handbook.
1767.1.3 List installations that the NEC covers and those not covered.
1767.1.4 List sequence of organizational components of the NEC.
1767.1.5 List steps for finding information in the NEC handbook.
1767.1.6 Demonstrate knowledge of how to read and understand the NEC.
1767.1.7 Explain and interpret tables from the NEC handbook.

Standard 2: Apply calculations to assure that NEC standards are met. (1767.S.2)

NEC Standards Objectives
Students will:

1767.2.1 Calculate conductor size and ampacity, overcurrent protection, grounding, bonding, and grounded conductor size.
1767.2.2 Calculate service entrance for single-family and multi-family dwelling units.
1767.2.3 Calculate service entrance for a commercial building.
1767.2.4 Calculate conduit and box conductor fill.

Residential Wiring

This course will introduce students to basic circuits, devices, and wiring techniques used in residential dwellings.

Standard 1: Interpret wiring data. (1769.S.1)

Wiring Data Objectives
Students will:
1769.1.1 Draw an electrical layout of a floor plan to meet minimum NEC specifications.
1769.1.2 Draw a cable layout of floor plan.

Standard 2: Install service entrance equipment and material. (1769.S.2)

Equipment and Material Objectives
Students will:
1769.2.1 List components of and calculate minimum size of service entrance needed.
1769.2.2 Indicate clearances for service drop per NEC regulations.
1769.2.3 Describe installations of underground (lateral) service entrance.

Standard 3: Install lighting and receptacle outlets. (1769.S.3)

Lighting and Receptacle Outlets Objectives
Students will:
1769.3.1 Replace existing fixtures, switches, and receptacles.
1769.3.2 Install and troubleshoot single-pole, three-way, and four-way switching circuits.
1769.3.3 Install split-wired receptacle circuits.

Standard 4: Install protective devices. (1769.S.4)

Protective Devices Objectives
Students will:
1769.4.1 Explain differences between overload, overcurrent, and short circuit.
1769.4.2 Install ground fault circuit breakers and GFCI receptacle outlets.
1769.4.3 Describe the operations of fuses and circuit breakers.

Standard 5: Install appliances and special circuits. (1769.S.5)

Appliances and Special Circuits Objectives
Students will:
1769.5.1 Discuss NEC requirements for appliances and special circuits.
1769.5.2 Install baseboard and wall mounted heating units, with controls.
1769.5.3 Install various fans.
1769.5.4 Install and troubleshoot water heating units.

Standard 6: Install low-voltage systems. (1769.S.6)

Low-Voltage Systems Objectives
Students will:
1769.6.1 Install and troubleshoot door bell and chime systems.
1769.6.2 Install low-voltage thermostats for heat control.
1769.6.3 Install and/or explain low-voltage landscape lighting systems.

Rotating Devices and Control Circuitry

This course will introduce students to basic control circuits, pilot devices, motor controls, relays, motor braking circuits, alternators and generators and how to troubleshoot AC and DC motors.

Standard 1: Demonstrate safe work habits. (1771.S.1)

Safe Work Habits Objectives
Students will:
1771.1.1 List and explain personal and electrical safety rules applicable to rotating equipment.
1771.1.2 List and explain hand and tool safety rules applicable to rotating equipment.

Standard 2: Interpret blueprints, schematics, and block diagrams for control circuitry. (1771.S.2)

Control Circuitry Objectives
Students will:
1771.2.1 Draw a block diagram of a motor control system.
1771.2.2 Demonstrate knowledge of elementary wiring diagrams and ladder logic.
1771.2.3 Install motor control centers and systems, using wiring diagrams.
1771.2.4 List and identify motor and motor control symbols.

Standard 3: Demonstrate knowledge and skills applicable to pilot devices. (1771.S.3)

Pilot Devices Objectives
Students will:
1771.3.1 Explain purpose and uses of pilot devices.
1771.3.2 Explain and list various types of electronic and mechanical sensors and pilot devices.
1771.3.3 Explain counter circuits.
1771.3.4 Install and troubleshoot various pilot devices and their circuits.

Standard 4: Demonstrate knowledge and skills related to motor controls. (1771.S.4)

Motor Controls Objectives
Students will:
1771.4.1 Explain the difference between manual and automatic circuits.
1771.4.2 List the equipment and parts needed for automatic circuits.
1771.4.3 Identify basic motor control circuits.
1771.4.4 Connect basic AC and DC circuits for automatic and manual control.
1771.4.5 Explain and demonstrate basic troubleshooting of control circuits.
1771.4.6 Install jogging and plugging circuits.
1771.4.7 Install reversing circuits.
1771.4.8 Demonstrate the use of a phase rotation meter.

Standard 5: Apply knowledge and skills to relays. (1771.S.5)

Relays Objectives
Students will:
1771.5.1 Describe and explain relays and relay circuits.
1771.5.2 Identify and install overload relays in control circuits.
1771.5.3 Identify and install potential-type relays in control circuits.
1771.5.4 Explain the difference between relay and magnetic starters.
1771.5.5 Explain troubleshooting techniques of relay and magnetic starters.
1771.5.6 Check various relays for faults or defects.

1771.5.7 Explain, check, and adjust various types of time delay relays.

Standard 6: Differentiate between the different types of motor braking circuits. (1771.S.6)

Motor Braking Circuits Objectives
Students will:
1771.6.1 Explain the various types of braking circuits for AC and DC motors.
1771.6.2 Describe dynamic braking circuits for AC and DC motors.

Standard 7: Troubleshoot AC and DC motors. (1771.S.7)

AC and DC Motors Objectives
Students will:
1771.7.1 Describe the various types of single-phase and three-phase AC motors and DC motors.
1771.7.2 Install, check, and troubleshoot various types of single-phase and three-phase motors in a circuit.
1771.7.3 Install, check, and troubleshoot various types of DC motors in a circuit.

Standard 8: Demonstrate knowledge and skills related to alternators and generators. (1771.S.8)

Alternators and Generators Objectives
Students will:
1771.8.1 List the major parts of an alternator and a generator and explain the function of each part.
1771.8.2 List and describe the different types of alternators and generators.
1771.8.3 Check alternators and generators for faults and defects.

Special Applications In Electronics

This is a special course for more advanced students to introduce them to the basic theory and operation of programmable logic controllers, fiber optics, and lasers.

Standard 1: Demonstrate a working knowledge of programmable logic controllers (P.L.C.'s). (1773.S.1)

Programmable Logic Controllers Objectives
Students will:
1773.1.1 Define terms associated with PLC's.
1773.1.2 Illustrate special symbols associated with PLC's.
1773.1.3 Demonstrate programming basics.
1773.1.4 Program relay, timer, counter and sequencer instructions.
1773.1.5 Edit a program.
1773.1.6 Utilize the EEPROM memory module.

Standard 2: Demonstrate a working knowledge of fiber optics. (1773.S.2)

Fiber Optics Objectives
Students will:
1773.2.1 Define terms and special schematic symbols associated with fiber optics.
1773.2.2 Construct fiber optic circuitry.
1773.2.3 Use test equipment to analyze inputs and outputs of fiber optic circuits.
1773.2.4 Splice fibers and apply fiber optic connectors.

Standard 3: Demonstrate a working knowledge of lasers. (1773.S.3)

Lasers Objectives
Students will:
1773.3.1 Demonstrate safe work habits with lasers.
1773.3.2 Define terms and special schematic symbols associated with laser equipment and laser circuitry.
1773.3.3 Demonstrate knowledge of laser and light physics.
1773.3.4 Troubleshoot laser power supplies.
1773.3.5 Construct laser circuits.
1773.3.6 Perform laser experiments.
1773.3.7 Analyze findings from tests and measurements taken on laser circuits.
1773.3.8 Troubleshoot laser circuitry.

Analog Circuits

This course will introduce students to the skills and technology involved in analog circuits and their use in the modern electronics field.

Standard 1: Construct basic analog circuits and use a variety of test equipment to analyze and troubleshoot them. (1781.S.1)

Analog Circuits Objectives
Students will:
1781.1.1 Describe the chemical bonding in semiconductor devices.
1781.1.2 Graphically illustrate characteristic curves for diodes and transistors used in analog circuitry.
1781.1.3 Match light characteristics and properties for various opto-electronic devices.
1781.1.4 Utilize solid state testing equipment to determine the usability of diodes and transistors.
1781.1.5 Use oscilloscopes to determine the proper operation and gain of various amplifiers.
1781.1.6 Interpret parts manuals for ordering components.
1781.1.7 Write reports on troubleshooting methods, providing steps taken to locate and replace faulty components and sub-systems.

Standard 2: Construct amplifier circuits and predict results. (1781.S.2)

Amplifier Objectives
Students will:
1781.2.1 Experiment with amplifier biasing methods used to obtain different classes of operations.
1781.2.2 Experiment with various coupling methods between stages of amplification.
1781.2.3 Determine gains of different types of amplifier circuits.

Standard 3: Troubleshoot systems and sub-systems to locate and correct faults. (1781.S.3)

Systems and Sub-systems Objectives
Students will:
1781.3.1 Define an electronic sub-system, an electronic system, and electronic input, process, and output.
1781.3.2 Apply critical thinking skills to sub-system level troubleshooting of electronic systems.
1781.3.3 Illustrate a block diagram of an electronic system.
1781.3.4 Use sub-system input and output measurement data to determine if a system has a fault.
1781.3.5 Write technical reports on the findings of sub-system measurements and evaluation.

Basic AC Circuits

This course will introduce students to the skills and technology involved in AC circuits and their use in the modern electronics field.

Standard 1: Evaluate components used with alternating current. (1783.S.1)

Alternating Current Objectives
Students will:
1783.1.1 Define capacitance, explain the purpose for capacitors in electronic circuits, and how a capacitor stores electrical energy.
1783.1.2 Explain the construction of a capacitor and how the value and voltage ratings relate to size and types.
1783.1.3 Measure the charge and discharge time of various capacitors.
1783.1.4 Define inductance and describe the application of inductive components to electronics.
1783.1.5 Use an L-C analyzer to check the value and condition of various capacitors and inductors.
1783.1.6 Draw the schematic symbols for capacitors, inductors, and transformers.
1783.1.7 Describe basic operation of a transformer.

Standard 2: Utilize basic test equipment to evaluate circuits. (1783.S.2)

Evaluate Circuits Objectives
Students will:
1783.2.1 Use an oscilloscope to observe function generator outputs.
1783.2.2 Measure peak to peak voltages with an oscilloscope.
1783.2.3 Use a meter to measure voltage and current.
1783.2.4 Use a frequency counter to measure frequency.
1783.2.5 Convert voltages between peak to peak and R.M.S. valves.

Standard 3: Evaluate magnetic and electromagnetic properties. (1783.S.3)

Magnetic and Electromagnetic Objectives
Students will:
1783.3.1 Identify, select, handle, and properly store magnetic devices and ferromagnetic materials.
1783.3.2 Construct a simple relay and use it as a control device in a basic electrical circuit.
1783.3.3 Analyze transformer voltage readings for loaded and unloaded conditions.
1783.3.4 Solve mathematical problems related to the use of transformers and transformer turns ratios.
1783.3.5 Perform graphing and graphical analysis of various measured data.

Standard 4: Construct AC circuits and use a variety of test equipment to analyze them. (1783.S.4)

AC Circuits Objectives
Students will:
1783.4.1 Use logarithmic, exponential, and trigonometric functions related to AC circuit analysis.
1783.4.2 Use a magnet to identify various ferrous and non-ferrous materials.
1783.4.3 Identify, select, handle, and properly store magnetic devices and ferromagnetic materials.
1783.4.4 Use oscilloscopes, frequency counters, DMM's and function generators to observe and record voltage, phase, and frequency data for a variety of LR, RC, and RLC circuits.
1783.4.5 Use an L-C analyzer to check the value and condition of various capacitors and inductors.
1783.4.6 Test and determine usability of transformers, inductors, capacitors, and resistors (both fixed value and variable).
1783.4.7 Test and determine usability of relays, solenoids, and other magnetic devices.
1783.4.8 Use computer software to analyze AC circuits.

Basic Solid State Devices and Circuits

This course will introduce students to the skills and technology involved in basic solid state devices and circuits and their use in the modern electronics field.

Standard 1: Demonstrate a fundamental knowledge and practical understanding of analog devices and basic circuits. (1785.S.1)

Analog Devices and Basic Circuits Objectives
Students will:
1785.1.1 Identify different types of diodes and transistors.
1785.1.2 Use diodes to construct half-wave, full-wave, and bridge rectifier circuits.
1785.1.3 Identify anodes and cathodes of diodes and LEDs.
1785.1.4 Identify basic anodes and cathodes of transistors (PNP and NVN).
1785.1.5 Construct and analyze basic transistor amplifiers (CB, CC, and CE).
1785.1.6 Analyze the output waveforms of various filtered and non-filtered power supplies.
1785.1.7 Select, and properly handle, diodes and transistors for various applications in circuits.
1785.1.8 Use cross-reference guides to determine appropriate substitutes for solid-state components.
1785.1.9 Use test instruments to check the static condition of various solid-state components/devices.
1785.1.10 Use an oscilloscope to observe the operation of an amplifier.
1785.1.11 Use proper troubleshooting procedures to find faults in amplifiers.

Standard 2: Demonstrate a fundamental knowledge and practical understanding of digital devices and basic circuits. (1785.S.2)

Digital Devices and Basic Circuits Objectives
Students will:
1785.2.1 Analyze basic logic gates operation with truth table.
1785.2.2 Identify basic logic gates schematic symbols.
1785.2.3 Use logic probe to observe logic gate operation.
1785.2.4 Use oscilloscope to observe logic gate operation.
1785.2.5 Identify pin locations on various I.C. packages.

DC Circuits and Electron Physics

This course will introduce students to the skills and technology in DC circuits and electron physics.

Standard 1: Describe electron physics as it relates to voltage, current and resistance. (1787.S.1)

Electron Physics Objectives
Students will:
1787.1.1 Demonstrate the law of electrical/electrostatic charges (Coulombs Law)
1787.1.2 State the law of magnetism.
1787.1.3 Use a magnet to identify various ferrous and non-ferrous materials.

Standard 2: Analyze D.C. circuits mathematically. (1787.S.2)

D.C. Circuits Objectives
Students will:
1787.2.1 Use calculators to solve algebraic equations for series, parallel, and complex DC circuits.
1787.2.2 Interpret and convert units of measurement for DC circuits.
1787.2.3 Perform calculations for meter and circuit loading effect.
1787.2.4 Use Ohm's Law to analyze circuits.
1787.2.5 Use Kirchoff's Law, Therening's Law, and Norton's Law to analyze circuits.

Standard 3: Demonstrate knowledge of basic safety rules and equipment as it relates to electronics technology. (1787.S.3)

Safety Rules and Equipment Objectives
Students will:
1787.3.1 Follow all safety precautions when working with electricity.
1787.3.2 Explain and demonstrate the proper use and care of tools, machines, and equipment in the
1787.3.3 electronics laboratory.
1787.3.4 Identify, demonstrate proper use and care of, all basic personal safety devices and
1787.3.5 equipment.

Standard 4: Construct DC circuits and analyze them by making various static and dynamic measurements. (1787.S.4)

DC Circuits Objectives
Students will:
1787.4.1 Identify, select, and properly handle resistors, fuses and other protective devices, control
1787.4.2 devices, and EMF producing devices.
1787.4.3 Lay out electronic components with which to construct circuits and sub-systems.
1787.4.4 Use an EMF, conductors, various control devices, protective devices, and various types of loads to construct, observe, and record results of basic electrical circuits.
1787.4.5 Construct and analyze voltage and current divider networks.
1787.4.6 Locate and replace faulty components in series, parallel, and complex DC circuits.
1787.4.7 Locate and repair continuity problems in DC circuits.
1787.4.8 Use an ammeter to measure the current flowing in opened and closed circuits.
1787.4.9 Use power supplies and VOM's/ DMM's to obtain active DC circuit measurements.
1787.4.10 Use an oscilloscope to analyze DC circuitry.
1787.4.11 Use computer software to analyze DC circuits.

Digital Circuits

This course will introduce students to the skills and technology involved in digital circuits and their use in the modern electronics field.

Standard 1: Perform math skills related to digital circuitry. (1789.S.1)

Digital Circuitry Objectives
Students will:
17891.1 Apply boolean algebra to solve logic functions.
17891.2 Perform binary, octal, decimal, and hexadecimal conversions and calculations.
17891.3 Use Kavanaugh maps to simplify logic functions.

Standard 2: Analyze digital circuits mathematically and theoretically. (1789.S.2)

Analyze Digital Circuits Objectives
Students will:
1789.2.1 Operate a transistor as a digital switch.
1789.2.2 Construct and analyze the basic logic gates.
1789.2.3 Assemble and analyze adder circuits.
1789.2.4 Assemble converter circuits and use a seven-segment display to observe their output and operation.
1789.2.5 Construct and analyze combinational logic circuits.
1789.2.6 Explore the digital applications of various families of integrated circuits (TTL, CMOS, etc.).
1789.2.7 Convert AND/OR logic circuits to NAND/NOR logic circuits.

Standard 3: Construct digital circuits and use test equipment to analyze and troubleshoot them. (1789.S.3)

Construct Digital Circuits Objectives
Students will:
1789.3.1 Use logic probes and pulsers to observe the behavior of various digital devices.
1789.3.2 Use oscilloscopes to analyze output waveforms of timing circuits.
1789.3.3 Locate and correct faults in basic logic circuits.

Electronics Specializations

This course will introduce students to the skills and technology involved in the various specializations in the modern electronics field.

Standard 1: Troubleshoot AC and DC circuits. (1791.S.1)

AC and DC Circuits Objectives

Students will:

1791.1.1 Solve simultaneous linear equations for circuit analysis.
1791.1.2 Apply network analysis to solve for unknown variables in DC circuits with multiple voltage sources.
1791.1.3 Perform calculations for internal resistance of voltage sources and maximum power transfer.
1791.1.4 Construct and analyze analog meter circuitry.
1791.1.5 Interpret and determine accuracy of measurements in DC circuits.
1791.1.6 Construct and obtain resistance, voltage, and current readings in passive and active parallel DC circuits.
1791.1.7 Construct and obtain resistance, voltage, and current readings in passive and active complex DC circuits
1791.1.8 Construct and analyze DC circuits that contain multiple voltage sources.
1791.1.9 Construct and obtain resistance, voltage, and current readings in passive and active series DC circuits.
1791.1.10 Solve for unknown values resulting from the use of inductors and capacitors in circuits.
1791.1.11 Restore faulty AC circuits to proper operating conditions.

Standard 2: Troubleshoot active devices and analog circuits. (1791.S.2)

Active Devices and Analog Circuits Objectives

Students will:

1791.2.1 Construct single stage amplifier circuits (common base, common collector, and common emitter).
1791.2.2 Analyze both static and dynamic operating characteristics of various single stage amplifiers.
1791.2.3 Construct and analyze multistage discrete component power amplifiers.
1791.2.4 Explain the applications for field effect transistors and test for usability.
1791.2.5 Identify and test thyristor devices.
1791.2.6 Construct and analyze thyristor circuitry.
1791.2.7 Construct and perform operational tests on oscillator circuits.
1791.2.8 Interpret manuals to determine maintenance procedures.
1791.2.9 Maintain technical logs.
1791.2.10 Construct and analyze voltage and current regulator circuits.
1791.2.11 Locate and correct faults in both regulated and non-regulated power supplies.
1791.2.12 Locate and correct faults in various types of amplifier circuits and systems.

Standard 3: Troubleshoot digital and microprocessor circuits. (1791.S.3)

Digital and Microprocessor Circuits Objectives

Students will:

1791.3.1 Locate and correct faults in oscillator and timer circuits.
1791.3.2 Interpret schematics and block diagrams to determine primary circuits functions.
1791.3.3 Assemble and analyze IC RAM, ROM, and EPROM circuits.
1791.3.4 Examine the operation of microprocessor devices.
1791.3.5 Construct JFET and MOSFET circuits and perform waveform analysis of inputs and outputs.
1791.3.6 Construct and analyze operational and linear IC amplifier circuits.
1791.3.7 Differentiate between, and identify pin arrangements of, various integrated circuits such as;

operational amplifiers, linear IC amps, oscillators, timers, and voltage regulators.
1791.3.8 Construct and analyze active diode circuits, to include comparators.
1791.3.9 Construct and observe outputs of counter circuits driven by timers.
1791.3.10 Construct and analyze a stable, monostable, and bistable multivibrator circuits.
1791.3.11 Assemble and analyze encoders and decoders.
1791.3.12 Locate and correct faults in multivibrator circuits.
1791.3.13 Troubleshoot and repair advanced digital circuitry.
1791.3.14 Analyze digital systems to determine faulty subsystem assemblies.
1791.3.15 Locate and repair faulty interfacing of microprocessor systems.
1791.3.16 Analyze specification/data sheets for digital components.
1791.3.17 Assemble and analyze multiplexers and demultiplers.
1791.3.18 Construct and observe the operation of shift-registers.
1791.3.19 Load and execute basic programs in microprocessors.

Standard 4: Prepare reports on status of systems and sub-system. (1791.S.4)

Systems And Sub-System Objectives
Students will:
1791.4.1 Identify a problem related to an electronic system, and form a hypothesis.
1791.4.2 State the need to research the problem, list the procedures for carrying out the research, and conduct the research in accordance with the listed procedures.
1791.4.3 Present the finding to a group of peers, stating conclusions based upon the research findings.
1791.4.4 Prepare defect, failure, and equipment evaluation reports.

Standard 5: Evaluate systems and sub-systems. (1791.S.5)

Evaluate Systems and Sub-Systems Objectives
Students will:
1791.5.1 Identify input and output waveforms of various analog and digital sub-systems and systems.
1791.5.2 Illustrate input and output signals of various electronic power supplies and analog sub-systems.
1791.5.3 Use block diagrams of different kinds of systems and networks to describe the function of each block.
1791.5.4 Define and describe systems that operate in biomedical, communications, computer, and electromechanical networks.
1791.5.5 Obtain a signal output from a function generator and display this signal on an oscilloscope.
1791.5.6 Utilize electronic test instruments to observe and record input and output data of various electronic sub-systems, then write a technical report on the findings and determine if a system has a fault.
1791.5.7 Apply critical thinking skills to sub-system level troubleshooting of electronic power supplies and analog systems.
1791.5.8 Replace faulty sub-systems and test the overall systems for proper operation.
1791.5.9 Write reports on troubleshooting methods, providing steps taken to locate and replace faulty components and sub-systems.
1791.5.10 Construct sub-system assemblies to produce various electronics systems.
1791.5.11 Lay out electronic components with which to construct circuits and sub-systems.

Fundamentals of Electricity

This course will introduce students to the fundamental skills related to electricity. Students will become familiar with the use of meters and other equipment used in the field of electricity, and learn how to construct a variety of circuits.

Standard 1: Identify, explore/evaluate career opportunities related to electricity. (1793.S.1)

Electricity Objectives
Students will:
1793.1.1 Describe a variety of careers related to electricity, and the training necessary to be successful in those careers.
1793.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of electricity.
1793.1.3 Identify sources of information about careers in electricity.

Standard 2: Demonstrate knowledge of electrical safety. (1793.S.2)

Electrical Safety Objectives
Students will:
1793.2.1 Describe the effect of current on the human body.
1793.2.2 List general safety precautions when working with electricity.
1793.2.3 Identify various types of safety devices used with electricity.
1793.2.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1793.2.5 List and describe the safe use of basic hand and power tools used in the field of electricity.

Standard 3: Interpret blueprints, schematics and technical orders. (1793.S.3)

Blueprint Objectives
Students will:
1793.3.1 Demonstrate knowledge of blueprint reading.
1793.3.2 Demonstrate knowledge of schematic reading.
1793.3.3 Explain the reasons for building plans and specifications.

Standard 4: Apply electrical math concepts. (1793.S.4)

Electrical Math Concepts Objectives
Students will:
1793.4.1 Demonstrate knowledge of Ohm's law and power formulas.
1793.4.2 Calculate branch circuit loads.

Standard 5: Demonstrate the proper use and care of electrical meters. (1793.S.5)

Electrical Meters Objective
Students will:
1793.5.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 6: Construct and analyze basic circuits. (1793.S.6)

Basic Circuits Objectives
Students will:
1793.6.1 Describe the electrical classification of conductors, insulators, and semi-conductors.

1793.6.2 Describe electrical current and differentiate between the different kinds of current.
1793.6.3 Define voltage, current, resistance, and power.
1793.6.4 List, and schematically represent the components that make up a basic electrical circuit.
1793.6.5 Connect dry cells into various series and parallel arrangements and measure and record voltage readings across each battery configuration.
1793.6.6 Conduct experiments that demonstrate the production of an electromotive force, obtaining voltage readings from experiments.
1793.6.7 Construct, solve and troubleshoot series, parallel and complex circuits.

Standard 7: Demonstrate proper techniques in making connections/wire splices. (1793.S.7)

Connections/Wire Splices Objectives
Students will:
1793.7.1 Properly remove insulation and make tap, pigtail and western union splices.
1793.7.2 Apply solderless terminals, wire nuts, and insulating tape to the ends of various sized wires.

Standard 8: Perform basic soldering techniques. (1793.S.8)

Soldering Objectives
Students will:
1793.8.1 Demonstrate proper use and care for soldering tools and equipment.
1793.8.2 Demonstrate correct stripping, tinning, and soldering procedures.
1793.8.3 Identify characteristics of a good solder connection.

Wiring and Soldering

This course will introduce students to the skills and technology involved in the wiring and soldering of modern components and circuit boards, etc.

Standard 1: Soldering techniques. (1795.S.1)

Soldering Techniques Objectives
Students will:

1795.1.1 Remove and replace components on printed circuit boards, repairing any damage to the boards.
1795.1.2 Identify and use heat sinks when soldering heat sensitive components to circuits boards.
1795.1.3 Prepare wires, terminals, components, and printed circuit boards for soldering.
1795.1.4 Solder wires and components to terminals and printed boards.
1795.1.5 Solder and desolder single sided boards, multilayered boards, and surface mounted devices.

Standard 2: Demonstrate proper procedures when handling, maintaining, and constructing printed circuit boards. (1795.S.2)

Circuit Boards Objectives
Students will:

1795.2.1 Use computer software to generate printed circuit board design.
1795.2.2 Lay out printed circuit boards for etching.
1795.2.3 Use different methods to produce printed circuit boards, including applying basic chemistry principles to produce printed circuits on copper-clad boards.
1795.2.4 Demonstrate proper safety procedures when working with P.C. boards.
1795.2.5 Use parts diagrams and schematics to properly place and solder components to printed circuit boards.
1795.2.6 Test completed circuit boards for proper circuit operation.

Basic Masonry and Landscaping

This course will introduce students to basic skills in masonry and landscape maintenance; including safety, and tools, equipment and processes.

Standard 1: Demonstrate knowledge of basic masonry skills. (1801.S.1)

Basic Masonry Skills Objectives
Students will:

1801.1.1 Identify and describe common terms, tools and equipment used in the masonry field.
1801.1.2 Demonstrate proper safety skills associated with masonry work.
1801.1.3 Repair various types of masonry surfaces using proper materials; including filling expansion joints, repairing structural cracks, installing fasteners, and replacing bricks and blocks.
1801.1.4 Construct forms for masonry repair.
1801.1.5 Mix, float, edge and joint concrete and mortar.
1801.1.6 Waterproof masonry wall.

Standard 2: Demonstrate knowledge of basic landscape maintenance skills. (1801.S.2)

Landscape Maintenance Skills Objectives
Students will:

1801.2.1 Identify and describe common terms, tools, equipment, and materials associated with lands maintenance.
1801.2.2 Demonstrate proper safety skills associated with land maintenance.
1801.2.3 Demonstrate proper methods to repair and maintain lawns, including fill, grade, seed, mow, edge and trim turf.
1801.2.4 Select and apply herbicides, pesticides, and fertilizers for landscape planting.
1801.2.5 Plant trees, shrubs, and flowers, and maintain them by pruning trees and shrubs and maintaining flowerbeds.
1801.2.6 Properly use tools and materials for removal of snow and ice.
1801.2.7 Perform maintenance on landscape tools and equipment.

Basic Plumbing and Electricity

This course will introduce students to basic skills in basic plumbing and electricity; including safety, and tools, equipment and processes.

Standard 1: Demonstrate knowledge of basic plumbing skills. (1803.S.1)

Basic Plumbing Skills Objectives
Students will:
1803.1.1 Identify terms, tools, materials and fixtures common to plumbing repair.
1803.1.2 Demonstrate proper safety skills associated with plumbing work.
1803.1.3 Measure, cut, join and apply fittings to galvanized, black iron, copper, and plastic pipe and tubing.
1803.1.4 Demonstrate the ability to open clogged lines, using chemicals, a plunger, and a snake or auger.
1803.1.5 Demonstrate ability to winterize water supply lines, traps and drains.

Standard 2: Demonstrate skills related to advanced plumbing repair. (1803.S.2)

Advanced Plumbing Repair Objectives
Students will:
1803.2.1 Perform tests to detect leaks on water pipes and repair leaking faucets and pipes.
1803.2.2 Clean gas furnace burner chamber and thermocouple, ventilate vapor from confined area and test for leaks.
1803.2.3 Properly maintain water heaters and furnaces, including: installation of pressure safety valve, adjustment of temperature, and lighting of pilot lights.

Standard 3: Demonstrate knowledge of basic electrical skills. (1803.S.3)

Basic Electrical Skills Objectives
Students will:
1803.3.1 Identify terms, tools, materials and fixtures common to electrical repair.
1803.3.2 Perform safety skills associated with electrical work.
1803.3.3 Replace defective electrical fixtures, such as: receptacles, switches, sockets, cords and plugs.
1803.3.4 Replace fluorescent and incandescent bulbs and fuses.
1803.3.5 Remove and replace faulty burners and oven heating elements in electric ranges.

Standard 4: Demonstrate skills related to advanced electrical maintenance. (1803.S.4)

Advanced Electrical Maintenance Objectives
Students will:
1803.4.1 Identify and explain the uses of basic electrical hardware items such as: switches, outlets, work boxes, and wiring.
1803.4.2 Test electrical circuits for power.
1803.4.3 Remove, replace, and adjust thermostats, and ballast and starters in fluorescent fixtures.

Fundamentals of Facilities Maintenance

This course will introduce students to the basic skills in preventive and corrective facilities maintenance. Students will become familiar with general basic tools, materials and processes necessary for facility and landscape maintenance.

Standard 1: Identify, explore, and evaluate career opportunities related to facilities maintenance. (1805.S.1)

Facilities Maintenance Objectives
Students will:
1805.1.1 Describe a variety of careers related to facilities maintenance, and the training necessary to be successful in those careers.
1805.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of facilities maintenance.
1805.1.3 Identify sources of information about careers in facilities maintenance.

Standard 2: Demonstrate knowledge of basic safety as it relates to maintaining facilities and landscapes. (1805.S.2)

Basic Safety Objectives
Students will:
1805.2.1 Recognize and follow general shop safety guidelines.
1805.2.3 Select and wear appropriate protective equipment.
1805.2.3 Demonstrate proper lifting techniques.
1805.2.4 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.
1805.2.5 Demonstrate proper use and handling of fundamental job related chemicals, including mixing, applying, storing and disposing of chemicals.
1805.2.6 Demonstrate the proper selection and use of fire extinguishers.

Standard 3: Demonstrate knowledge of basic blueprint reading. (1805.S.3)

Basic Blueprint Reading Objectives
Students will:
1805.3.1 Interpret scale drawings.
1805.3.2 Identify and define common architectural drawings symbols.
1805.3.3 Demonstrate knowledge of specifications and codes.

Standard 4: Demonstrate the ability to read and follow technical instructions. (1805.S.4)

Read and Follow Technical Instructions Objectives
Students will:
1805.4.1 Read and complete work orders.
1805.4.2 Read and follow technical instructions in manuals, texts, specifications and codes.

Standard 5: Demonstrate knowledge of basic carpentry skills. (1805.S.5)

Basic Carpentry Skills Objectives
Students will:
1805.5.1 Review proper use of a variety of common carpentry tools and equipment to measure, cut and fasten stock.
1805.5.2 Select appropriate carpentry materials for a specific job.

1805.5.3 Perform maintenance on carpentry tools.
1805.5.4 Construct simple wall, floor and roof frames.

Standard 6: Repair or refinish a variety of facility components. (1805.S.6)

Facility Components Objectives
Students will:
1805.6.1 Repair a variety of flooring, including repairing vinyl flooring and replacing ceramic floor tile.
1805.6.2 Remove and apply new finish to a variety of surfaces using multiple methods and materials.
1805.6.3 Properly prepare a wall and hang wallpaper.
1805.6.4 Repair window glass by removing glass, measuring and cutting new glass and installing and glazing new window.
1805.6.5 Remove and replace damaged window screen.
1805.6.6 Repair stair components by removing treads and risers, cutting a new stringer, and replacing treads and risers.
1805.6.7 Repair, replace hardware, and install doors.
1805.6.8 Properly cut angles and coped joints on molding and install trim, filling nail holes.

Standard 7: Demonstrate the ability to weatherize structures. (1805.S.7)

Weatherize Structures Objectives
Students will:
1805.7.1 Caulk windows and doors.
1805.7.2 Install weather stripping.

Standard 8: Maintain gutters and down spouts. (1805.S.8)

Gutters And Down Spouts Objectives
Students will:
1805.8.1 Join, level and apply caulk to gutters and down spouts.
1805.8.2 Clean gutters and down spouts and install leaf guards.

Forestry I

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Practice safety principles in forestry. (1811.S.1)

Forestry Objectives
Students will:
1811.1.1 Wear appropriate safety gear.
1811.1.2 Maintain a safe working environment.
1811.1.3 Identify safety hazards of fire line construction and mop-up.

Standard 2: Identify economic trees in West Virginia. (1811.S.2)

Trees in West Virginia Objectives
Students will:
1811.2.1 Identify the following trees:
Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine
1811.2.2 Identify by leaves.
1811.2.3 Identify by bark.
1811.2.4 Identify by taste and smell.
1811.2.5 Identify by twigs.
1811.2.6 Identify by fruit.
1811.2.7 Explain tree morphology.

Standard 3: Demonstrate forest fire fighting procedures. (1801.S.3)

Forest Fire Fighting Procedures Objectives
Students will:
1811.3.1 Construct fire line using hand tools.
1811.3.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
1811.3.3 Extinguish remaining fire spots after main fire is contained (mop-up).
1811.3.4 Determine direction for fire line construction.
1811.3.5 Repair and service equipment after fire is extinguished.
1811.3.6 Use backpack pump to fight fire directly.

Standard 4: Perform forest measurement techniques. (1801.S.4)

Forest Measurement Techniques Objectives
Students will:
1811.4.1 Set up instrument for surveying.
1811.4.2 Use compass to maintain direction.
1811.4.3 Make linear measurements using surveyor=s chain with compass.
1811.4.4 Make linear measurements by pacing with compass.
1811.4.5 Calculate the number of acres in a timber tract.
1811.4.6 Use hand/staff compass to determine bearing or Azimuth.
1811.4.7 Identify units of measurement (mile, rod, chain and acre).

Standard 5: Utilize silviculture treatment for timber stand improvement. (1811.S.5)

Silviculture Treatment Objectives
Students will:

1811.5.1 Determine major forest type and primary uses.
1811.5.2 Determine proper spacing using D+6 rule.
1811.5.3 Use increment borer to determine age and growth rate.
1811.5.4 Select and utilize pruning and thinning methods for a timber stand.
1811.5.5 Fell and limb trees.

Standard 6: Demonstrate laboratory investigations and hands-on learning.

Laboratory Investigations Objectives
Students will:

1811.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1811.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1811.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1811.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Utilize chainsaw safety. (1812.S.1)

Chainsaw Safety Objectives
Students will:
1812.1.1 Identify and use safety clothing and equipment.
1812.1.2 Use proper starting techniques.
1812.1.3 Identify proper safety rules with 100% accuracy.
1812.1.4 Identify and correct hazardous operational conditions.

Standard 2: Perform chainsaw maintenance. (1812.S.2)

Chainsaw Maintenance Objectives
Students will:
1812.2.1 Properly sharpen chain.
1812.2.2 Determine and adjust chain for proper tension.
1812.2.3 Demonstrate proper cleaning and storage of chainsaw.
1812.2.4 Replace sprocket on chainsaw.
1812.2.5 Replace bar on chainsaw.
1812.2.6 Replace broken chain link.
1812.2.7 Clean and service carburetor and air cleaner.
1812.2.8 Replace chain clutch as needed.
1812.2.9 Adjust carburetor for maximum efficiency.
1812.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber. (1812.S.3)

Standing Timber Objectives
Students will:
1812.3.1 Define and calculate board foot and cord wood volumes.
1812.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
1812.3.3 Determine number of logs per tree using tree stick or clinometers.
1812.3.4 Record volume number of individual trees using tally sheet method.
1812.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
1812.3.6 Calculate volume of pulpwood by cords.

Standard 4: Perform wildlife habitat management. (1812.S.4)

Wildlife Habitat Management Objectives
Students will:
1812.4.1 Monitor and improve water quality.
1812.4.2 Improve habitat for bird, fish and game.
1812.4.3 Understand the importance of the forest, field and edge.
1812.4.4 Identify potential den and mast trees.

Standard 5: Perform laboratory investigations. (1812.S.5)

Laboratory Investigations Objectives

Students will:

1812.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1812.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1812.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1812.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Apply technology the forestry industry. (1812.S.6)

Forestry Industry Objectives

Students will:

1812.6.1 Use computers and the World Wide Web (WWW) to solve problems related to work-based experience programs in forestry, locate, evaluate, and collect information from a variety of sources related to forestry, develop positive attitudes toward technology that supports lifelong learning, collaboration, personal pursuits, and productivity.

1812.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1812.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1812.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Demonstrate personal leadership skills. (1813.S.1)

Personal Leadership Skills Objectives
Students will:
1813.1.1 Describe the parts of a good speech.
1813.1.2 Explain how to present a desirable speech.
1813.1.3 Correctly conduct research in topics concerning forestry.
1813.1.4 Deliver a speech on a forestry topic.

Standard 2: Perform advanced dendrology skills. (1813.S.2)

Dendrology Skills Objectives
Students will:
1813.2.1 Identify by flowers.
1813.2.2 Identify by growth characteristics.
1813.2.3 Identify by site conditions.
1813.2.4 Identify by distribution.

Standard 3: Perform forestry safety skills. (1813.S.3)

Forestry Safety Skills Objectives
Students will:
1813.3.1 Demonstrate safety with hand tools.
1813.3.2 Demonstrate safety with chainsaws.
1813.3.3 Demonstrate safety with tractors.
1813.3.4 Demonstrate safety on the fire line.

Standard 4: Operate and maintain forestry equipment. (1813.S.4)

Forestry Equipment Objectives
Students will:
1813.4.1 Demonstrate the proper use and maintenance of hand tools.
1813.4.2 Demonstrate the proper use and maintenance of chainsaws.
1813.4.3 Demonstrate the proper use and maintenance of tractors.
1813.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Apply silvicultural practices for timber stands. (1813.S.5)

Timber Stands Objectives
Students will:
1813.5.1 Demonstrate forest reproduction techniques.
1813.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
1813.5.3 Define clear-cut.

Standard 6: Perform laboratory investigations. (1813.S.6)

Laboratory Investigations Objectives

Students will:

1813.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1813.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1813.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1813.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to the forestry industry. (1813.S.7)

Forestry Industry Objectives

Students will:

1813.7.1 Use computers and the World Wide Web (WWW).

1813.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1813.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1813.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Demonstrate parliamentary procedure. (1814.S.1)

Parliamentary Procedure Objectives
Students will:
1814.1.1 Identify proper procedures for conducting a meeting.
1814.1.2 Write and present a committee report.
1814.1.3 Identify components of a program of activities.

Standard 2: Apply safety procedures of fire line construction. (1814.S.2)

Fire Line Construction Objectives
Students will:
1814.2.1 Explain fire line safety.
1814.2.2 Explain fire line construction.
1814.2.3 Explain forest fire mop-up.
1814.2.4 Explain the use of topographic maps in locating access roads and trails.
1814.2.5 Explain the use of topographic maps in fire location.
1814.2.6 Repair, service and store equipment.

Standard 3: Use forest surveying equipment. (1814.S.3)

Forest Surveying Equipment Objectives
Students will:
1814.3.1 Interpret surface features using aerial photography and topographic maps.
1814.3.2 Conduct a boundary survey using a hand compass and pacing.
1814.3.3 Visit a courthouse and conduct a title search.
1814.3.4 Plot bearings from deeds.
1814.3.5 Calculate percent slope using a clinometer.
1814.3.6 Orientate topographic map using hand compass.
1814.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Use best management practices in forest road construction. (1814.S.4)

Forest Road Construction Objectives
Students will:
1814.4.1 Lay out roads in compliance with West Virginia forest standards.
1814.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
1814.4.3 Explain the importance of installing culverts, water breaks and "woods" bridges.
1814.4.4 Design skid roads.
1814.4.5 Monitor water quality.
1814.4.6 Reseed skid trails and log landings.

Standard 5: Process, measure and market wood products. (1814.S.5)

Wood Products Objectives
Students will:
1814.5.1 Demonstrate competency in felling, bucking and skidding selected trees.

1814.5.2 Scale logs and lumber.
1814.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Conduct laboratory investigations. (1814.S.6)

Laboratory Investigations Objectives
Students will:
1814.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1814.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1814.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1814.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to real world forestry problems. (1814.S.7)

Forestry Problems Objectives
Students will:
1814.7.1 Use computers and the World Wide Web (WWW) to solve problems, locate, evaluate, and collect information from a variety of sources, develop positive attitudes toward technology, personal pursuits, and productivity.
1814.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1814.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
1814.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Identify and use forestry equipment. (1815.S.1)

Forestry Equipment Objective
Students will:

1815.1.1 Identify and use the following: tree scale stick, increment bore, drip torch, fire rake, clinometers, hand compass, soil tube, jacobs staff, staff compass, chaps, hard hat/face, shield, pulaski, tree marking gun, wedge prism, stereoscope, log rule, data recorder, plastic flagging, chainsaw, ear protection, dot grid, and a dibble or tree planter.

Standard 2: Conduct a timber cruise. (1815.S.2)

Timber Cruise Objectives
Students will:

1815.2.1 Mark boundaries and corners of tract.
1815.2.2 Use compass to direct cruising operation.
1815.2.3 Measure distance between plot center (by pacing).
1815.2.4 Record trees using tally sheet method.
1815.2.5 Use wedge prism (BAF 10 or BAF 20).
1815.2.6 Calculate board foot volumes using double log scale.

Standard 3: Apply best management practices in a forestry setting. (1815.S.3)

Forestry Setting Objectives
Students will:

1815.3.1 Lay out roads in compliance with West Virginia forest standards.
1815.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
1815.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
1815.3.4 Design skid roads.
1815.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
1815.3.6 Scale logs and lumber.
1815.3.7 Monitor water quality.
1815.3.8 Reseed skid trails and log landings.

Standard 4: Conduct safe laboratory investigations. (1815.S.4)

Laboratory Investigations Objectives
Students will:

1815.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1815.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1815.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1815.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Apply technology to forestry industry. (1815.S.5)

Forestry Industry Objectives

Students will:

1815.5.1 Use computers and the World Wide Web (WWW) to solve problems related to forestry, locate, evaluate, and collect information related to forestry, develop positive attitudes toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.

1815.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1815.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1815.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Demonstrate process/workplace skills used in forestry. (1815.S.6)

Process/Workplace Skills Objectives

Students will:

1815.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1815.6.2 Explore careers available in forestry.

1815.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

1815.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1815.6.5 Demonstrate correct language usage in all oral and written work.

1815.6.6 Perform effectively in both leadership and non-leadership roles.

1815.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

1815.6.8 Participate as a team member to complete a variety of assignments.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Research career development in outdoor recreation. (1816.S.1)

Outdoor Recreation Objectives
Students will:
1816 .1.1 Identify regional career opportunities in outdoor recreation including, park ranger, recreation manager, instructor, conservation officer, first aid/safety expert, entertainment manager, business manager, outdoor guide, youth camp operator, campground owner, riding stable owner and lifeguard.
1816.1.2 Profile outdoor recreation specialists.
1816.1.3 Develop teamwork skills and activities.
1816..1.4 Develop public relation skills.

Standard 2: Participate in outdoor safety activities. (1816.S.2)

Outdoor Safety Activities Objectives
Students will:
1816.2.1 Obtain Red Cross first aid certificate.
1816.2.2 Obtain Red Cross adult CPR certificate.
1816.2.3 Identify potential outdoor safety hazards.
1816.2.4 Identify poisonous plants.
1816.2.5 Identify poisonous insects.
1816.2.6 Identify poisonous animals.
1816.2.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 3: Identify natural resource and recreation areas. (1816.S.3)

Natural Resource and Recreation Areas Objectives
Students will:
1816.3.1 Describe geological formations.
1816.3.2 Recognize services required for recreational areas.
1816.3.3 Recognize facilities required for recreational areas.
1816.3.4 Identify endangered species of plants and animals.
1816.3.5 Identify wetlands and riparian zones.
1816.3.6 Describe local, state and federal laws related to recreational enterprises.

Standard 4: Recognize business opportunities and promotions in outdoor recreation. (1816.S.4)

Business Opportunities and Promotions Objectives
Students will:
1816.4.1 Recognize income potential from various types of recreational enterprises.
1816.4.2 Identify business procedures required of recreational enterprises.
1816.4.3 Design advertising media to promote a recreational area effectively.

Standard 5: Safely conduct laboratory investigations. (1816.S.5)

Laboratory Investigations Objectives
Students will:

1816.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1816.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1816.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1816.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Apply technology to real world problems. (1816.S.6)

Real World Objectives
Students will:
1816.6.1 Use computers and the World Wide Web (WWW) to solve problems related programs in outdoor recreation, locate, evaluate, and collect information from a variety of sources related to outdoor recreation, develop positive attitudes toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.
1816.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1816.6.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 7: Demonstrate process/work place skills used in outdoor recreation. (1816.S.7)

Process/Work Place Skills Objectives
Students will:
1816.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
1816.7.2 Explore careers available in outdoor recreation.
1816.7.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
1816.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
1816.7.5 Demonstrate correct language usage in all oral and written work.
1816.7.6 Perform effectively in both leadership and non-leadership roles.
1816.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
1816.7.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Study the history of wildlife management. (1817.S.1)

History of Wildlife Management Objectives
Students will:
1817.1.1 Define and describe wildlife trends and their impact on management.
1817.1.2 Identify wildlife legalities and ethics.
1817.1.3 Define natural resources conservation.

Standard 2: Describe the concepts of wildlife management. (1817.S.2)

Concepts of Wildlife Management Objectives
Students will:
1817.2.1 Define succession stages related to wildlife management.
1817.2.2 Describe carrying capacity as related to wildlife.
1817.2.3 Define horizontal and vertical structuring.
1817.2.4 Explain ecological principles and their application to wildlife management.

Standard 3: Determine wildlife habitat management practices. (1817.S.3)

Wildlife Habitat Management Practices Objectives
Students will:
1817.3.1 Explain ecological principles applied to fish and wildlife.
1817.3.2 Design a wildlife management plan.
1817.3.3 Identify forest management practices for improving habitat.
1817.3.4 Identify agricultural management practices for improvement of habitat.
1817.3.5 Define and describe wetlands and their use.
1817.3.6 Identify government assistance available for habitat improvement.
1817.3.7 Construct and erect wildlife feeders/nest boxes.

Standard 4: Use technology to identify animal life histories. (1817.S.4)

Animal Life Histories Objectives
Students will:
1817.4.1 Identify life cycles of wildlife species.
1817.4.2 Describe interrelationship of wildlife species.
1817.4.3 Identify common relationships between humans and wildlife.
1817.4.4 Search the Internet to secure wildlife information.

Standard 5: Determine water and water quality relationships for conservation. (1817.S.5)

Water Quality Relationships Objectives
Students will:
1817.5.1 Identify sources of water and water pollutants.
1817.5.2 Explain the effects to water pollution on the ecosystem.
1817.5.3 Identify point and non-point source pollution and describe possible controls.
1817.5.4 Describe wetlands, their use, importance and preservation.
1817.5.5 Explain methods of protecting water sources.

Standard 6: Describe wildlife values as a resource to society. (1817.S.6)

Wildlife Values Objectives

Students will:

1817.6.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
1817.6.2 Define recreational values of fish and wildlife.
1817.6.3 Describe social values of fish and wildlife.
1817.6.4 Identify esthetic values of fish and wildlife resources.
1817.6.5 Describe scientific and educational values of fish and wildlife.
1817.6.6 Evaluate negative impact of wild animals on humans.

Concrete Finishing

This course will apply the concepts, applications, and techniques necessary for various phases of concrete construction.

Standard 1: Understand concrete construction and finishing concepts. (1821.S.1)

Concrete Finishing Objectives
Students will:
1821.1.1 Define terms associated with concrete construction.
1821.1.2 Identify the composition and characteristics of concrete.
1821.1.3 Identify the uses of concrete as a building material.
1821.1.4 Identify the effect of craftsmanship on finished concrete.
1821.1.5 Explain the concrete construction process.
1821.1.6 Identify site operation work requirements.
1821.1.7 Explain the career potentials in concrete construction and finishing.

Standard 2: Understand and apply safety used in concrete construction. (1821.S.2)

Concrete Construction Objectives
Students will:
1821.2.1 Describe and wear different types of safety gear for the work site.
1821.2.2 State the guidelines for dressing appropriately for concrete work.
1821.2.3 Describe how to safely handle concrete when forming, placing, curing, and finishing.
1821.2.4 Describe safety precautions to follow when working in extreme heat and cold.
1821.2.5 Describe safety precautions to follow when working with hazardous materials.
1821.2.6 Describe proper procedures for handling and maintaining concrete construction tools safely.

Standard 3: Analyze the properties of concrete. (1821.S.3)

Properties of Concrete Objectives
Students will:
1821.3.1 Describe the properties of concrete.
1821.3.2 Explain how the properties of concrete are used in construction.
1821.3.3 Determine how the ingredients of concrete influence mix, placement, finishing, durability, and performance.
1821.3.4 Describe quality-control tests on concrete ingredients, fresh concrete, and hardened concrete.
1821.3.5 Mix a test batch of concrete.
1821.3.6 Perform a slump test.

Standard 4: Identify tools and equipment used in concrete construction. (1821.S.4)

Tools and Equipment Objectives
Students will:
1821.4.1 Name the tools used in placing and finishing concrete.
1821.4.2 Name the power equipment used in placing and finishing concrete.
1821.4.3 Describe how each tool is use.
1821.4.4 Describe how the power equipment is used.
1821.4.5 Associate trade terms with the appropriate tools and equipment.

Standard 5: Prepare worksite for concrete placement. (1821.S.5)

Worksite Objectives
Students will:
1821.5.1 Describe basic site layout using levels and measuring tools.
1821.5.2 Properly locate, grade, and build forms for horizontal placement.
1821.5.3 Perform compaction activities on subgrades.
1821.5.4 Describe various joints and where to locate them.
1821.5.5 Describe various reinforcements and how to place them.
1821.5.6 Describe information needed when ordering concrete.

Standard 6: Placing concrete. (1821.S.6)

Placing Concrete Objectives
Students will:
1821.6.1 Describe how concrete is conveyed and placed.
1821.6.2 Draw up a pre-placement checklist.
1821.6.3 Demonstrate the use of equipment and tools for placing concrete.
1821.6.4 Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form.
1821.6.5 Associate trade names with the appropriate processes and equipment.

Standard 7: Apply basic concrete finishing techniques. (1821.S.7)

Finishing Techniques Objectives
Students will:
1821.7.1 Describe the basic finishing process.
1821.7.2 Use the following finishing hand tool: float, edger, groover, and trowel.
1821.7.3 Mark and cut joints with a saw.
1821.7.4 Apply a broom finish.
1821.7.5 Apply a rubbing finish.
1821.7.6 Associate trade terms with the appropriate processes and equipment.

Standard 8: Curing and protecting concrete. (1821.S.8)

Curing and Protecting Objectives
Students will:
1821.8.1 Describe the process of curing concrete.
1821.8.2 Identify methods of curing concrete.
1821.8.3 Describe how each method is applied.
1821.8.4 Identify when each method is used.
1821.8.5 Associate trade terms with the appropriate processes and equipment.

Standard 9: Troubleshooting basic concrete construction problems. (1821.S.9)

Construction Problems Objectives
Students will:
1821.9.1 Describe a basic troubleshooting methodology that can be used to identify a variety of concrete construction problems and their causes.
1821.9.2 Identify problems with fresh concrete and describe ways to prevent them.
1821.9.3 Identify different concrete defects such as crazing, cracking, dusting, scaling, popouts, and efflorescence, and describe ways to prevent them.

Finishing Carpentry

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and installing interior and exterior wall, ceiling and floor coverings.

Standard 1: Estimate and install insulation and vapor barriers in walls, ceilings and floors. (1823.S.1)

Finish Carpentry Objectives
Students will:
1823.1.1 Install insulation in walls, ceiling, and floors.
1823.1.2 Explain the necessity for vapor barriers and properly install them.

Standard 2: Cover interior walls. (1823. S.2)

Interior Walls Objectives
Students will:
1823.2.1 Estimate and hang dry wall on interior walls and ceiling.
1823.2.2 Properly finish dry wall (nail holes, seams, corners).
1823.2.3 Prime and paint interior walls.
1823.2.4 Properly install paneling and appropriate trim.

Standard 3: Finish interior of a construction project. (1823.S.3)

Finish Interior Objectives
Students will:
1823.3.1 Install interior doors, door locksets, and windows.
1823.3.2 Cut and install baseboards, and door and window casings.
1823.3.3 Install various wall covering materials.
1823.3.4 Cut and install various floor coverings.
1823.3.5 Install cabinets.

Standard 4: Finish exterior of a construction project. (1823.S.4)

Finish Exterior Objectives
Students will:
1823.4.1 Estimate and install fascia and soffit on eaves and rake.
1823.4.2 Install attic ventilation.
1823.4.3 Properly install exterior siding.
1823.4.4 Paint exterior surfaces.

Foundations and Framing

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and constructing building foundations and rough framing.

Standard 1: Estimate and construct foundation. (1825.S.1)

Foundation Objectives
Students will:

1825.1 Use transit to turn and square corners, read and mark elevations and excavation lines and to set grade stakes.
1825.2 Estimate and install batter boards.
1825.3 Estimate and install foundation footer forms and expansion joints in preparation for concrete pour.
1825.4 Build stair forms for concrete steps.
1825.5 Estimate concrete yardage, pour and finish concrete.

Standard 2: Estimate and construct floor framing. (1825.S.2)

Floor Framing Objectives
Students will:

1825.2.1 Estimate, lay out and install a built up wood girder, termite protection, and sill plate.
1825.2.2 Estimate, lay out and install a floor frame, including: band boards, floor joists, cross bridging, openings and sub-floor.

Standard 3: Estimate and construct wall framing. (1825.S.3)

Wall Framing Objectives
Students will:

1825.3.1 Layout, erect and align exterior walls.
1825.3.2 Layout, erect and align interior partitions.
1825.3.3 Construct rough opening headers.
1825.3.4 Install second top plates to walls and partitions.
1825.3.5 Install backing for fixtures, cabinets, and bulkhead.
1825.3.6 Install sheathing on exterior walls.
1825.3.7 Install windows and doors in exterior wall rough openings.
1825.3.8 Layout and install ceiling joists.
1825.3.9 Cut and assemble stringers, risers, and treads for a basic set of stairs.

Standard 4: Estimate and construct roof framing. (1825.S.4)

Roof Framing Objectives
Students will:

1825.4.1 Layout, cut and install king posts and ridge boards.
1825.4.2 Layout, cut and install roof rafters.
1825.4.3 Layout, cut and install rough fascia, gable end studs, and collar beams.
1825.4.4 Install roof sheathing, drip edge, asphalt or fiberglass shingles, and ridge vents.

Fundamentals of Building Construction

This course will introduce students to basic knowledge of building plans and materials and safe work habits used in general building construction occupations.

Standard 1: Identify, explore, and evaluate career opportunities related to building construction. (1827.S.1)

Career Opportunities Objectives
Students will:
1827.1.1 Describe a variety of careers related to building construction, and the training necessary to be successful in those careers.
1827.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of building construction.
1827.1.3 Identify sources of information about careers in building construction.

Standard 2: Identify and demonstrate proper personal safety practices. (1827.S.2)

Safety Practices Objectives
Students will:
1827.2.1 Review and follow general construction safety guidelines.
1827.2.2 Demonstrate proper lifting techniques.
1827.2.3 Identify and demonstrate proper use and care of all basic personal safety equipment including hearing and eye protection, hard hats and shoes.

Standard 3: Identify basic hand tools and demonstrate safe and appropriate use. (1827.S.3)

Hand Tools Objectives
Students will:
1827.3.1 Choose the proper hand tools for given applications, and describe the proper care and maintenance of each.
1827.3.2 Demonstrate adjustments possible with each tool.

Standard 4: Identify basic power tools (portable and stationary) and demonstrate safe and appropriate use. (1827.S.4)

Power Tools Objectives
Students will:
1827.4.1 Choose proper power tool for a given application.
1827.4.2 Recognize and identify appropriate blade or bit for given situation, and demonstrate the ability to change blades and bits on cutting tools.
1827.4.3 Demonstrate possible adjustments to power tools.
1827.4.4 Describe proper care and maintenance of power tools and machinery.

Standard 5: Demonstrate proper and safe use of ladders and scaffolds. (1827.S.5)

Ladders and Scaffolds Objective
Students will:
1827.5.1 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.

Standard 6: Demonstrate the ability to interpret blueprints. (1827.S.6)

Blueprints Objectives

Students will:

1827.6.1 Review the basic information found in foundation and floor plans, including dimensions, symbols and scale.

1827.6.2 Prepare a written cost estimate for a construction project.

1827.6.3 Identify information on window and door schedules.

1827.6.4 Interpret blueprints for plumbing and wiring specifications.

1827.6.5 Determine fixtures needed for a construction project.

Standard 7: Identify and properly use a variety of framing materials. (1827.S.7)

Framing Materials Objectives

Students will:

1827.7.1 Identify basic framing materials, including solid lumber, plywood, and various fasteners.

1827.7.2 Perform various forming, separating, and combining processes on construction materials.

Masonry and Plumbing

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and constructing masonry and plumbing systems.

Standard 1: Estimate, layout and prepare masonry materials for a foundation. (1829.S.1)

Foundation Objectives
Students will:
1829.1.1 Demonstrate safe work habits while working with masonry materials and equipment.
1829.1.2 Lay out and square a foundation using a transit and the 6-8-10 method.
1829.1.3 Discuss the size of footings for various widths of block, and pour a footer.
1829.1.4 Properly mix and spread mortar, build corners and foundation, install stretcher blocks and sill anchors.
1829.1.5 Properly install waterproofing and ventilation in a foundation.

Standard 2: Rough in a plumbing drain system. (1829.S.2)

Plumbing Drain System Objectives
Students will:
1829.2.1 Install drain lines according to code.
1829.2.2 Cut copper and plastic tubing for water supply.
1829.2.3 Apply appropriate fittings and fastening techniques to copper and plastic tubing.

Standard 3: Install finishing plumbing. (1829.S.3)

Finishing Plumbing Objectives
Students will:
1829.3.1 Properly install various plumbing fixtures (commode, lavatory, bath tub and/or shower).
1829.3.2 Install shut-off valves, faucets and screw-on fittings.
1829.3.3 Install hot water tank.

Basic Darkroom Procedures

This course will introduce students to the basic fundamentals of darkroom procedures, photographing and developing line and halftone negatives, and process color printing.

Standard 1: Demonstrate proper darkroom procedures. (1831.S.1)

Darkroom Procedures Objectives
Students will:
1831.1.1 Identify different types of process cameras, and list the basic parts of the camera.
1831.1.2 Identify and prepare film developing trays.
1831.1.3 Identify various safe lights and select proper safelight for different films.
1831.1.4 Determine base and emulsion sides of film.
1831.1.5 Name three (3) methods of developing film.
1831.1.6 Select best F-stop, temperature and percentage for developing film.

Standard 2: Demonstrate safe work habits while working with graphic arts materials and equipment. (1831.S.2)

Safe Work Habits Objectives
Students will:
1831.2.1 Identify and practice safety rules used in the darkroom.
1831.2.2 Describe safe use and disposal of toxic and/or flammable substances and chemicals.

Standard 3: Demonstrate the ability to photograph and develop line negatives. (1831.S.3)

Line Negatives Objectives
Students will:
1831.3.1 Identify various types of film used in a process camera, and handle film properly.
1831.3.2 Describe camera operator's sensitivity guide.
1831.3.3 Prepare camera for basic exposure.
1831.3.4 Produce and evaluate line negatives.

Standard 4: Produce halftone negatives. (1831.S.4)

Halftone Negatives Objectives
Students will:
1831.4.1 Compute main and flash exposures.
1831.4.2 Describe the proper care of contact screens.
1831.4.3 Expose and develop a halftone negative.
1831.4.4 Identify three (3) areas of halftone negatives.
1831.4.5 List three (3) exposures for halftone negatives.
1831.4.6 Identify and evaluate halftone dots.
1831.4.7 Describe a duotone.

Standard 5: Identify the basic principles of process color printing. (1831.S.5)

Color Printing Objectives
Students will:
1831.5.1 Describe flat and process color printing.
1831.5.2 Describe the difference between additive and subtractive colors, and name the four process color inks.
1831.5.3 List two methods of process color separation.

1831.5.4 Identify proper filters for process color negatives.
1831.5.5 Describe screen angle for process color negatives.
1831.5.6 Select proper film for process color separations.
1831.5.7 Identify color separation negatives.

Electronic Imaging

This course will introduce students to desktop publishing, including basic typesetting, image designs, proofreading, and computer scanning operations.

Standard 1: Perform basic typesetting procedures in desktop publishing images. (1833.S.1)

Typesetting Procedures Objectives
Students will:
1833.1.1 Identify and describe basic desktop publishing tools, equipment, and materials.
1833.1.2 Identify and properly use desktop publishing menus, toolboxes, and options.
1833.1.3 Design proper page layout and size, indicating guidelines, fold lines, and margins.
1833.1.4 Select font and point sizes.
1833.1.5 Perform copy fitting techniques.
1833.1.6 Setup printer for copy and make a print.

Standard 2: Identify appropriate proofreading knowledge and use. (1833.S.2)

Proofreading Objectives
Students will:
1833.2.1 Identify proofreading marks.
1833.2.2 Make corrections on galley proofs.
1833.2.3 Perform proper proofreading techniques by marking up copy for production of a printed piece.

Standard 3: Perform scanning operations. (1833.S.3)

Scanning Operations Objectives
Students will:
1833.3.1 Identify scanner hardware and software and describe its basic components, operations and limitations.
1833.3.2 Demonstrate appropriate scanner/program operations for line and continuous tone work.
1833.3.3 Place scanned graphics and /or photos into existing page layouts.

Standard 4: Operate digital cameras and software available for digital printing. (1833.S.4)

Digital Printing Objectives
Students will:
1833.4.1 Identify features of different types of digital cameras and printing equipment.
1833.4.2 Take pictures and transfer images to the computer using different types of digital cameras.
1833.4.3 Manipulate and organize images transferred from digital cameras.
1833.4.4 Utilize digital printing processes.

Fundamentals of Graphic Design and Production

This course will introduce students to the basic fundamentals of the graphic communications industry. Students will become familiar with safety in the graphic arts lab and basic techniques in drawing and illustration.

Standard 1: Demonstrate knowledge of career opportunities in graphic design and production. (1835.S.1)

Career Opportunities Objectives
Students will:
1835.1.1 Describe a variety of careers related to graphic design and production, and the training necessary to be successful in those careers.
1835.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of graphic design and production.
1835.1.3 Identify sources of information about careers in graphic design and production.

Standard 2: Identify a variety of basic graphic design equipment and materials. (1835.S.2)

Equipment and Materials Objectives
Students will:
1835.2.1 Identify and describe a variety of major printing processes.
1835.2.2 Name types of materials on which printing is done.
1835.2.3 Identify basic tools used in the graphic arts lab.

Standard 3: Demonstrate safe work habits in the graphic arts lab. (1835.S.3)

Safe Work Habits Objectives
Students will:
1835.3.1 Demonstrate job-related safety precautions and procedures regarding use of materials and equipment in the graphic arts lab.
1835.3.2 Describe proper precautions when handling toxic or flammable chemicals.

Standard 4: Identify legal restrictions regarding copy limitations. (1835.S.4)

Copy Limitations Objectives
Students will:
1835.4.1 Name three (3) elements of a copyright notice.
1835.4.2 Identify items that may and may not be copyrighted, and describe procedures to obtain permission to reproduce copyrighted materials.

Standard 5: Introduce design elements and principles to graphic applications. (1835.S.5)

Graphic Applications Objectives
Students will:
1835.5.1 Incorporate the design principles of balance, eye travel, contrast, repetition, focal point, and unity when developing illustrations.
1835.5.2 Differentiate between line, value, texture, depth, color, shape and rhythm.
1835.5.3 Using desktop publishing software, develop a three-panel brochure using appropriate layout, type, and clip art.

Standard 6: Demonstrate the principles of job planning and layout when producing layouts to customer specifications. (1835.S.6)

Customer Specifications Objectives

Students will:

1835.6.l Identify the elements for layouts, including: headline, subhead, copy-block, illustrations/photos, negative space, etc.

1835.6.2 Produce thumbnail sketches that reflect client expectations.

1835.6.3 Apply the inch/point/pica scales during layout through the mechanical preparation process.

1835.6.4 Identify and apply a variety of font styles, typefaces, and hand lettering.

1835.6.5 Incorporate hand and computer generated artwork and screen tints into layouts.

1835.6.6 Use a variety of layout tools, including: compasses, triangles, t-squares, templates, and French curves into layout and finished art preparation processes.

1835.6.7 Develop rough layouts.

1835.6.8 Choose paper stock, other medium, and ink colors for layouts.

1835.6.9 Develop a comprehensive layout, both hand and computer generated.

Graphic Communications

This course will introduce students to diffusion transfer principles, electrostatic platemaking, offset troubleshooting, multicolor press operations, advanced darkroom and developing procedures and preparations, and job ticket orders.

Standard 1: Demonstrate knowledge of diffusion transfer principles. (1837.S.1)

Diffusion Transfer Principles Objectives
Students will:
1837.1.1 Identify basic diffusion transfer processing equipment and materials for making line prints.
1837.1.2 Make a diffusion transfer halftone print.

Standard 2: Identify and produce an electrostatic plate. (1837.S.2)

Electrostatic Plate Objectives
Students will:
1837.2.1 Identify electrostatic platemaking materials and equipment.
1837.2.2 Prepare, process and evaluate an electrostatic plate.

Standard 3: Perform basic offset troubleshooting and preventive maintenance. (1837.S.3)

Maintenance Objectives
Students will:
1837.3.1 List conditions associated with paper stock feeding problems, adjust double-sheet detector, pile height, and pull-out rollers, and adjust feeder system for various paper weights.
1837.3.2 Change blanket and dampening roller covers.
1837.3.3 Deglaze press ink rollers.
1837.3.4 Adjust plate to blanket pressure and blanket to impressive cylinder pressure.
1837.3.5 Adjust dampening roller and press ink form roller pressure.
1837.3.6 Check press for register.
1837.3.7 Perform monthly lubrication routine.
1837.3.8 Check feed roller pressure.

Standard 4: Perform basic press operation to produce multicolor printed material. (1837.S.4)

Basic Press Operation Objectives
Students will:
1837.4.1 Print a duotone and a four-color process job.
1837.4.2 Perform basic press wash-up procedures.
1837.4.3 Print a multicolor job two-sided.
1837.4.4 Identify printed order of process color inks.
1837.4.5 Identify ink-water problems.

Standard 5: Demonstrate advanced darkroom and film developing procedures. (1837.S.5)

Darkroom and Film Developing Procedures Objectives
Students will:
1837.5.1 Describe standard exposure tests for line photography.
1837.5.2 Conduct exposure tests for contact screens.
1837.5.3 Select proper filter for color separation negatives.
1837.5.4 Identify and calculate exposures for color separation negatives.
1837.5.5 Set exposure computer for halftone density range for highlight and shadow areas.

1837.5.6 Describe a bump exposure.

Standard 6: Calculate and prepare job ticket orders. (1837.S.6)

Job Ticket Orders Objectives
Students will:
1837.6.1 Describe the production work-flow of a job.
1837.6.2 Prepare a production information job ticket/jacket.
1837.6.3 Determine the most feasible method of production and calculate production costs.

Image Assembly and Platemaking

This course will introduce students to the fundamentals of image assembly and platemaking, including: film masking, platemaking, principles of offset platemaking, and copy paste-up principles and procedures.

Standard 1: Perform copy paste-up principles and procedures. (1839.S.1)

Copy Paste-Up Objectives
Students will:
1839.1.1 Identify various types of camera copy.
1839.1.2 Identify and properly use a variety of paste-up tools, materials and equipment.
1839.1.3 Calculate reductions and enlargements.
1839.1.4 Indicate guidelines on a paste-up, and center copy.
1839.1.5 Crop photographs.
1839.1.6 Describe screen tints.
1839.1.7 Identify a combination paste-up.
1839.1.8 Prepare a complete layout for camera-ready copy.

Standard 2: Demonstrate knowledge of film masking and assembly by properly preparing a flat. (1839.S.2)

Preparing a Flat Objectives
Students will:
1839.2.1 Identify basic tools, materials and equipment used in film masking.
1839.2.2 Identify parts of a flat.
1839.2.3 Position and tape both line and halftone negatives to masking sheet, then cut windows in flat.
1839.2.4 Prepare an un-ruled masking sheet.
1839.2.5 Prepare and opaque negatives.
1839.2.6 Identify register marks.
1839.2.7 Prepare flats for a step-and-repeat exposure and a double-burn exposure.
1839.2.8 Select appropriate screen tint and percentage.

Standard 3: Perform the basic techniques and principles of offset platemaking. (1839.S.3)

Platemaking Objectives
Students will:
1839.3.1 Identify various types of plate ends.
1839.3.2 Identify the basic areas of an offset plate.
1839.3.3 List types of plate materials, and describe their proper care.
1839.3.4 Identify plate exposure equipment and determine the correct plate exposure for a given situation.
1839.3.5 Describe a ten-step exposure guide.
1839.3.6 Expose a step-and-repeat plate and a double-burn plate.
1839.3.7 Develop a plate using a two-step method.
1839.3.8 Develop a subtractive plate.
1839.3.9 Prepare gum-arabic solution, gum and store plates.
1839.3.10 Describe a pin register system.

Offset Press and Binding Process

This course will introduce students to the fundamentals of operating an offset press, knowledge of papers, and cutting and binding operations.

Standard 1: Demonstrate knowledge of offset press fundamentals. (1841.S.1)

Offset Press Objectives
Students will:
1841.1.1 Explain the principle behind offset printing.
1841.1.2 Identify the basic systems of a sheet-fed press.
1841.1.3 Determine pH of fountain solution and properly mix fountain solution.
1841.1.4 List basic press operation and wash-up procedures.

Standard 2: Identify components of typical offset press system. (1841.S.2)

Components of Offset Press Objectives
Students will:
1841.2.1 Name the three main cylinders of an offset press.
1841.2.2 Identify components of the inking system, dampening system, feeder system, register board, and delivery system.
1841.2.3 Identify operator control features.

Standard 3: Operate an offset press. (1841.S.3)

Operate Offset Press Objectives
Students will:
1841.3.1 Read production information on job ticket.
1841.3.2 Describe and perform proper safety precautions during press operations.
1841.3.3 Prepare fountain concentrate and dampening system.
1841.3.4 Select color of ink and prepare the inking system.
1841.3.5 Install offset plate.
1841.3.6 Setup feeder system.
1841.3.7 Select proper paper size and weight.
1841.3.8 Prepare register board and paper delivery system.
1841.3.9 Print a single color job.
1841.3.10 Print a job on NCR stock.
1841.3.11 Print a multicolor job.
1841.3.12 Print a job work and tumble.
1841.3.13 Print a job work and turn.
1841.3.14 Setup and print a job on cover stock.
1841.3.15 Perform press wash-up procedures.
1841.3.16 Adjust night latch.
1841.3.17 Setup and print envelopes.

Standard 4: Identify and demonstrate knowledge of papers used in the printing industry. (1841.S.4)

Paper Objectives
Students will:
1841.4.1 Define common paper terms.
1841.4.2 Identify a watermark.
1841.4.3 Identify and describe the two sides of a sheet.

1841.4.4 Test for grain direction of paper stock.
1841.4.5 Identify various kinds of paper and match kinds of paper with their use.
1841.4.6 Select standard weights for various kinds of paper.

Standard 5: Calculate and perform paper-cutting operations. (1841.S.5)

Paper-cutting Operations Objectives
Students will:
1841.5.1 Read production information on job ticket.
1841.5.2 Calculate number of cuts from stock, identifying combination cuts.
1841.5.3 Describe and perform proper safety precautions during paper cutting operations.

Standard 6: Identify and perform bindery operations. (1841.S.6)

Bindery Operations Objectives
Students will:
1841.6.1 List operations performed in the bindery areas.
1841.6.2 Name two (2) types of stitches.
1841.6.3 Pad # 20 paper stock and carbonless paper stock.
1841.6.4 Drill stock for 3-ring binders.
1841.6.5 Perform spiral binding operations.
1841.6.6 Perform folding operations.
1841.6.7 Gather and collate a multi-page booklet.

Basic Illustration

This course will introduce students to the basic fundamentals of safety, design elements, medium and art tool exploration, perspective, shading techniques, and various printing methods.

Standard 1: Demonstrate safe work habits in the commercial art studio. (1851.S.1)

Safe Work Habits Objectives
Students will:
18511.1 Properly and safely use a variety of cutting tools (cutting board, Xacto knife, scissors, etc.).
18511.2 Properly and safely use toxic and/or flammable substances (permanent markers, rubber cement, fixative, etc.).

Standard 2: Execute a variety of media applications. (1851.S.2)

Media Applications Objectives
Students will:
1851.2.1 Apply line, value, texture, depth, color, shape and rhythm to designs.
1851.2.2 Draw using pen and ink.
1851.2.3 Draw using marker.
1851.2.4 Draw using various graphite and colored pencils.
1851.2.5 Draw using charcoal/pastels.
1851.2.6 Illustrate using a variety of paints: watercolor, oil, tempera, etc.

Standard 3: Draw using various perspective methods. (1851.S.3)

Draw Objectives
Students will:
1851.3.1 Draw using one-point, two-point, and three-point perspective at various eye levels.
1851.3.2 Draw using elliptical perspective horizontally and vertically, at various eye levels.
1851.3.3 Draw cast shadows using perspective techniques.

Standard 4: Draw and paint using various techniques. (1851.S.4)

Draw and Paint Objectives
Students will:
1851.4.1 Draw using soft pencil pressure techniques.
1851.4.2 Draw using pointillism/ stippling techniques.
1851.4.3 Draw using wash techniques.
1851.4.4 Draw using crosshatching techniques.
1851.4.5 Draw using airbrush techniques.

Standard 5: Explore various printing methods. (1851.S.5)

Printing Objectives
Students will:
1851.5.1 Create various relief prints using different media (cardboard, woodcuts, embossing, etc.)
1851.5.2 Create a screen print.

Computer Graphics

This course encompasses more advanced vector graphics software applications and faster graphic software applications.

Standard 1: Demonstrate proficiency with prepress concepts and graphic design production skills. (1853.S.1)

Production Skills Objectives
Students will:

1853.1.1 Incorporate photography into graphic design using 35 mm and /or digital photographic techniques.
1853.1.2 Scan and import images into graphic designs.
1853.1.3 Experiment with various input devices (keyboard, mouse, light pen, digitizing tablet).
1853.1.4 Develop awareness of Optical Character Recognition, external storage devices (Zip, Jazz drives, etc.), PDF format, and Pre-Flight software.
1853.1.5 Demonstrate understanding of the necessity for trapping.
1853.1.6 Produce and print out color separations for both spot and process color (CMVK) design projects.

Standard 2: Demonstrate your design proficiency through various advance design projects. (1853.S.2)

Design Projects Objectives
Students will:

1853.2.1 Layout a sign, design a billboard layout, design a logo and prepare it for reproduction
1853.2.2 Convert numerical data to effective visual representations: pie graphs, bar graphs, line graphs, etc.
1853.2.3 Develop a decorative design, such as borders, wallpaper design, wrapping paper design, etc.
1853.2.4 Layout/construct a package design and prepare for printing.
1853.2.5 Design/construct point-of-purchase display (easel); prepare for printing.
1853.2.6 Retouch photographs using imaging software (i.e., PhotoShop, PhotoPAINT, etc.).
1853.2.7 Use merge imaging software.

Standard 3: Solve a variety of complex graphic problems and prepare each design for reproduction. (1853.S.3)

Graphic Problems Objective
Students will:

1853.3.1 Design a multi-page printed piece that incorporates signatures and conforms to printing limitations.

Standard 4: Explore various intermediate processes used in design production. (1853.S.4)

Intermediate Processes Objectives
Students will:

1853.4.1 Operate a camera using various accessory equipment: lenses, tripods, cable release, strobe/flash, etc.
1853.4.2 Select film based on an understanding of how ASA relates to printed image, grain, light, etc.
1853.4.3 Apply depth of field, focus, competition, exposure, (spot and average metering), aperture/ shutter speed relationship to photographic assignments.
1853.4.4 Operate enlarger incorporating dodging and burning techniques.
1853.4.5 Mix chemistries for black and white photographic development per product instructions.

1853.4.6 Paint, fix and dry prints per product instructions.
1853.4.7 Layout a design and print it using silk-screen techniques (hand-cut or photographic).
1853.4.8 Disassemble and assemble airbrush.
1853.4.9 Set compressor gauges to proper pressure.
1853.4.10 Prepare media for airbrush (ink, watercolor, oil-based paint, etc.)
1853.4.11 Experiment with various frisketing methods: prepared, liquid, etc.
1853.4.12 Render a drawing/painting or retouch a photograph with airbrush.

Standard 5: Develop a portfolio with which to seek employment (or college acceptance) in the field of commercial art. (1853.S.5)

Portfolio Objectives
Students will:
1853.5.1 Complete the development of the portfolio started in previous course.
1853.5.2 Write a resume and a letter of introduction to accompany the portfolio.
1853.5.3 Complete a job application that references the portfolio.
1853.5.4 Participate in a real or a mock job interview.

Standard 6: Operate digital cameras. (1853.S.6)

Digital Cameras Objectives
Students will:
1853.6.1 Identify features of different types of digital cameras.
1853.6.2 Take pictures and transfer images to the computer using different types of digital cameras.
1853.6.3 Manipulate and organize images transferred from digital cameras.

Standard 7: Create animations using available software. (1853.S.7)

Animations Objectives
Students will:
1853.7.1 Identify animation software.
1853.7.2 Place images to create animations.
1853.7.3 Create frames from images to animate.
1853.7.4 Create and enhance multimedia animations.

Desktop Publishing

This course emphasizes page layout and desktop publishing skills using programs such as Adobe Pagemaker, Quark Express, or Corel Ventura.

Standard 1: Demonstrate proficiency with prepress concepts and graphic design production skills.
(1855.S.1)

Productions Skills Objectives
Students will:
1855.1.1 Format text (apply style, point size, leading, alignment, tabs, indents etc.).
1855.1.2 Scan and import illustrative and photographic images.
1855.1.3 Output layouts and color separations using inkjet and laser printers.
1855.1.4 Understand the advantages of Postscript Level III output.

Standard 2: Design a variety of page layout projects. (1855.S.2)

Page Layout Objectives
Students will:
1855.2.1 Design a newspaper ad and prepare it for reproduction.
1855.2.2 Design a magazine ad and prepare it for printing.
1855.2.3 Design a multi-panel brochure.
1855.2.4 Design a multi-page printed piece that incorporates signatures and conforms to printing limitations.
1855.2.5 Design a masthead and prepare a 4-page newsletter for reproduction.
1855.2.6 Import text originating from a word processing program.

Standard 3: Complete the development of a portfolio for the purpose of seeking employment (or college acceptance) in the field of commercial art/graphic design. (1855.S.3)

Portfolio Objectives
Students will:
1855.3.1 Complete development of a portfolio.
1855.3.2 Write a resume and a letter of introduction to accompany the portfolio.
1855.3.3 Complete a job application that references the portfolio.
1855.3.4 Participate in a real or a mock job interview.

Fundamentals of Graphic Design and Production

This course will introduce students to the basic fundamentals of the graphic communications industry. Students will become familiar with safety in the graphic arts lab and basic techniques in drawing and illustration.

Standard 1: Demonstrate knowledge of career opportunities in graphic design and production. (1857.S.1)

Career Opportunities Objectives
Students will:
1857.1.1 Describe a variety of careers related to graphic design and production, and the training necessary to be successful in those careers.
1857.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of graphic design and production.
1857.1.3 Identify sources of information about careers in graphic design and production.

Standard 2: Identify a variety of basic graphic design equipment and materials. (1857.S.2)

Equipment and Materials Objectives
Students will:
1857.2.1 Identify and describe a variety of major printing processes.
1857.2.2 Name types of materials on which printing is done.
1857.2.3 Identify basic tools used in the graphic arts lab.

Standard 3: Demonstrate safe work habits in the graphic arts lab. (1857.S.3)

Safe Work Habits Objectives
Students will:
1857.3.1 Demonstrate job-related safety precautions and procedures regarding use of materials and equipment in the graphic arts lab.
1857.3.2 Describe proper precautions when handling toxic or flammable chemicals.

Standard 4: Identify legal restrictions regarding copy limitations. (1857.S.4)

Copy Limitations Objectives
Students will:
1857.4.1 Name three (3) elements of a copyright notice.
1857.4.2 Identify items that may and may not be copyrighted, and describe procedures to obtain permission to reproduce copyrighted materials.

Standard 5: Introduce design elements and principles to graphic applications. (1857.S.5)

Graphic Applications Objectives
Students will:
1857.5.1 Incorporate the design principles of balance, eye travel, contrast, repetition, focal point, and unity when developing illustrations.
1857.5.2 Differentiate between line, value, texture, depth, color, shape and rhythm.
1857.5.3 Using desktop publishing software, develop a three panel brochure using appropriate layout, type, and clip art.

Standard 6: Demonstrate the principles of job planning and layout when producing layouts to customer specifications. (1857.S.6)

Customer Specifications Objectives

Students will:

1857.6.1 Identify the elements for layouts, including: headline, subhead, copy-block, illustrations/photos, negative space, etc.

1857.6.2 Produce thumbnail sketches that reflect client expectations.

1857.6.3 Apply the inch/point/pica scales during layout through the mechanical preparation process.

1857.6.4 Identify and apply a variety of font styles, typefaces, and hand lettering.

1857.6.5 Incorporate hand and computer generated artwork and screen tints into layouts.

1857.6.6 Use a variety of layout tools, including: compasses, triangles, t-squares, templates, and French curves into layout and finished art preparation processes.

1857.6.7 Develop rough layouts.

1857.6.8 Choose paper stock, other medium, and ink colors for layouts.

1857.6.9 Develop a comprehensive layout, both hand and computer generated.

Graphic Design

This course will introduce students to basic advertising concepts, and hand and computer generated layout procedures and paste-up/mechanical production.

Standard 1: Establish demographics for various target markets and develop market research skills. (1859.S.1)

Establish demographics for various target markets and develop market research skills objectives.
The student will:

1859.1.1 Make graphic design decisions regarding type, style, color and illustrative choices based on data such as age, sex, education level and occupation.

1859.1.2 Study client, product/service that is being promoted, potential customer and purpose of document being designed.

Standard 2: Execute correct hand generated paste-up/mechanical preparation skills. (1859.S.2)

Execute correct hand generated paste-up/mechanical preparation skills objectives.
The student will:

1859.2.1 Secure all elements for Paste-up/mechanical/camera-ready art/keyline.

1859.2.2 Scale art using grids, transfers, projections, and proportion wheels. Cut amberlith/rubylith for overlay color separation.

1859.2.3 Execute finished art for spot color printing.

1859.2.4 Specify type/mark up all copy.

1859.2.5 Set type via desktop publishing software program that conforms to industry standards (Pagemaker, Quark Express, etc.).

1859.2.6 Crop, size (scale), and key photographs.

1859.2.7 Assemble mechanical/camera-ready art for 1, 2, and 3 color spot color designs.

1859.2.8 Indicate appropriate printer/camera instructions on mechanical: trim marks, fold lines, register marks, inks and percentages, bleeds, die cuts, foil stamping, spot varnish, embossing, etc.

Standard 3: Use vector graphics software to properly execute a variety of computer generated design projects. (1859.S.3)

Use vector graphics software to properly execute a variety of computer generated design projects objectives.
The student will:

1859.3.1 Incorporate logo design into letterheads, envelopes, business cards, etc., for the purposes of corporate identity.

1859.3.2 Design a greeting card and prepare for printing.

1859.3.3 Draw cartoons/caricatures.

1859.3.4 Produce a story board for a TV ad, motion picture, video, etc.

Illustration

This course will introduce students to the fundamentals of color theory and figure drawing.

Standard 1: Apply color theory to illustrations. (1861.S.1)

Illustrations Objectives
Students will:
1861.1.1 Identify the components of the color wheel, i.e., primary, secondary, and tertiary, etc.
1861.1.2 Determine color combinations: complimentary, analogous, split-complimentary, triads, tetrads, etc. and use them in designs.
1861.1.3 Define the dimensions of color: hue, value, intensity, opacity, saturation.

Standard 2: Apply rules of proportion to figure drawing. (1861.S.2)

Figure Drawing Objectives
Students will:
1861.2.1 Produce renderings of both standard and fashion figures.
1861.2.2 Produce renderings of heads, faces, hands, and feet.
1861.2.3 Produce renderings of various textiles, including folds and textures.

Standard 3: Develop reference materials. (1861.S.3)

Reference Materials Objectives
Students will:
1861.3.1 Begin to develop a portfolio of your best samples of graphic design and illustrative pieces.
1861.3.2 Correctly mount and mat pieces for display in a portfolio.
1861.3.3 Develop and maintain a picture morgue for illustrative reference.

Electrical Maintenance

This course will introduce students to the maintenance of electrical systems and motors in industrial maintenance occupations. Students will become familiar with tools and components of electrical motors and will perform a variety of operations using them.

Standard 1: Read and interpret electrical schematics and diagrams. (1871.S.1)

Electrical Schematics and Diagrams Objective
Students will:
1871.1.1 Explain the difference between power and control circuits.

Standard 2: Replace electric motors and protective devices. (1871.S.2)

Electric Motors and Protective Devices Objectives
Students will:
1871.2.1 Explain relevant sections of the National Electric Code.
1871.2.2 Calculate circuit amperage.
1871.2.3 Explain the difference between starting and running amperage.
1871.2.4 Explain and demonstrate how a magnetic contactor works.

Standard 3: Change rotation of electric motors. (1871.S.3)

Electric Motors Objectives
Students will:
1871.3.1 Identify parts of a three-phase motor.
1871.3.2 Describe current flow in a three-phase motor.
1871.3.3 Rewire a three-phase motor to change motor rotation.
1871.3.4 Describe current flow in a DC motor.
1871.3.5 Rewire a DC motor to change motor rotation.

Standard 4: Perform maintenance on electric motors. (1871.S.4)

Maintenance Objectives
Students will:
1871.4.1 Explain lock out tag out rules.
1871.4.2 Explain types of motor controllers.
1871.4.3 Explain how to clean and lubricate motors.

Standard 5: Use electrical test equipment to troubleshoot motor control circuits. (1871.S.5)

Electrical Test Equipment Objectives
Students will:
1871.5.1 Obtain various readings with a VOM.
1871.5.2 Test and replace semiconductors.
1871.5.3 Test DC power supplies.
1871.5.4 Use transistors, diodes, and resistors in electrical circuits.
1871.5.5 Install and test silicon controlled rectifiers.

Fundamentals of Industrial Equipment Maintenance

This course will introduce students to entry level skills in industrial maintenance occupations. Students will become familiar with hand tools and power machines used in industrial mechanics and will perform a variety of operations using them.

Standard 1: Identify, explore, and evaluate career opportunities related to industrial mechanics. (1873.S.1)

Career Opportunities Objectives
Students will:
1873.1.1 Describe a variety of careers related to industrial mechanics, and the training necessary to be successful in those careers.
1873.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of industrial mechanics.
1873.1.3 Identify sources of information about careers in industrial mechanics.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to industrial mechanics. (1873.S.2)

Safety Rules Objectives
Students will:
1873.2.1 Recognize and follow general shop safety guidelines.
1873.2.2 Identify, select and demonstrate proper use and care of all basic personal safety equipment.
1873.2.3 Demonstrate the proper selection and use of fire extinguishers.
1873.2.4 Describe OSHA regulations necessary when using hazardous materials.
1873.2.5 Describe proper waste disposal of industrial lubricants.

Standard 3: Select and apply industrial lubricants. (1873.S.3)

Industrial Lubricants Objectives
Students will:
1873.3.1 Differentiate between oil, grease, and synthetic lubricants and describe various applications for each type.
1873.3.2 Explain how lubricants get contaminated.
1873.3.3 List possible handling and storage problems of lubricants.

Standard 4: Straighten a shaft using a press. (1873.S.4)

Shaft Objectives
Students will:
1873.4.1 Demonstrate the setup of an arbor press, shaft and dial indicator, take readings (data), explain run out, spring back, high point and flat spotting.
1873.4.2 Explain the effects of using heat on a shaft if used for straightening purposes.
1873.4.3 Differentiate between a normal shaft and a hardened shaft.
1873.4.4 Explain the magna fluxing and sonar devices for testing and inspecting for hairline cracks in shafts.

Standard 5: Adjust gibs for full operation. (1873.S.5)

Gibs Objectives
Students will:
1873.5.1 Describe the function of a gib and give examples of its application.

1873.5.2 Describe "excessive wear" and "galled" in relationship to gibs.
1873.5.3 Explain the setup and reading of a dial indicator and micrometer for checking a gib.

Standard 6: Fabricate and install safety guards. (1873.S.6)

Safety Guards Objectives

Students will:

1873.6.1 Identify materials to be used, and illustrate safety guards to be fabricated and installed.
1873.6.2 Explain how a conveyor system functions and what guards are required.

Standard 7: Assemble and align a drive mechanism for a conveyor system. (1873.S.7)

Conveyor System Objectives

Students will:

1873.7.1 Identify different types of conveyor systems, where and why they are used.
1873.7.2 Explain alignment alternatives and various shimming techniques.
1873.7.3 Locate and explain manufacturer's specifications of alignment data, capacity limitations, and assembly procedures.

Standard 8: Identify basic tools used in industrial mechanics and perform various processes. (1873.S.8)

Basic Tools Objectives

Students will:

1873.8.1 Choose the proper tools for given applications, and describe the proper care and maintenance of each.
1873.8.2 Demonstrate adjustments necessary for each tool.
1873.8.3 Drill and tap internal threads and cut external threads of various size and pitch, using the proper thread cutting lubricants.
1873.8.4 Demonstrate the proper use of a band saw and power hack saw, and calculate the desired teeth per inch and cutting speed for various materials.
1873.8.5 Differentiate between tempering and annealing for ferrous and non-ferrous metals.
1873.8.6 Remove damaged screws or bolts, using various sizes and styles of screw extractors.
1873.8.7 Grind surfaces using portable electric grinder, using the proper abrasive.
1873.8.8 Demonstrate the use and maintenance of hand, pedestal and machine grinders by sharpening and deburring tools.
1873.8.9 Differentiate between drilling, boring, counter boring, spot facing, reaming and honing using a drill press, and demonstrate each procedure, using the proper lubricant.
1873.8.10 Mount work in universal lathe chuck, face work piece and center drill work piece.
1873.8.11 Bore and counter bore a hole and cut internal and external threads using lathe.
1873.8.12 Cut a horizontal surface and an external taper on lathe using compound rest.

Standard 9: Inspect and troubleshoot moving parts on machines. (1873.S.9)

Machines Objectives

Students will:

1873.9.1 Differentiate between damaged and normal set up using manufacturer's specifications.
1873.9.2 Identify parts of gear box, open gear drive and explain gear alignments and meshing requirements.

Hydraulics and Pneumatic Systems

This course will introduce students to the application of hydraulic and pneumatic systems used in industrial maintenance occupations. Students will become familiar with tools and components of hydraulics and pneumatics and will perform a variety of operations using them.

Standard 1: Read and interpret hydraulic and pneumatic diagrams. (1875.S.1)

Hydraulic and Pneumatic Diagrams Objectives
Students will:
1875.1.1 Identify and describe the function of component parts of hydraulic and pneumatic systems.
1875.1.2 Interpret symbols for hydraulics and pneumatics using CAD.
1875.1.3 Identify and describe mechanical servo valves and cartridge valves.

Standard 2: Refill or clean filters and refill system in hydraulic and pneumatic systems. (1875.S.2)

Clean Filters and Refill System Objectives
Students will:
1875.2.1 Describe techniques for draining systems.
1875.2.2 Identify various filters, screen, strainers, and types of hydraulic and compressor oils.

Standard 3: Replace and align hydraulic motors and pumps. (1875.S.3)

Hydraulic Motors and Pumps Objectives
Students will:
1875.3.1 Describe hydraulic pumps, the basic parts and the function of each part.
1875.3.2 Explain how a hydraulic unit functions.
1875.3.3 Identify alignment and couplings.
1875.3.4 Align piston rod of hydraulic pump and adjust pressure.

Standard 4: Install hydraulic and pneumatic lines and measure pressure. (1875.S.4)

Install Hydraulic and Pneumatic Lines Objectives
Students will:
1875.4.1 Identify piping, fittings, gaskets, and seals.
1875.4.2 Inspect and replace pressure relief valve.

Standard 5: Install guards and covers. (1875.S.5)

Guards and Covers Objective
Students will:
1875.5.1 Explain and use manufacturer's specifications for clearance and attachment techniques.

Engine Machining

This course will introduce students to the basic fundamentals related to high performance engine machining. Students will become familiar with the machining operations necessary to change a conventional stock engine into an oversized performance engine through technology.

Standard 1: Identify, explore, and evaluate different types of high performance engines. (1901.S.1)

High Performance Engines Objectives
Students will:

1901.1.1 Inspect complete engine components for wear – block, heads, connecting rods, crankshaft, camshaft, lifers, etc.
1901.1.2 Determine hardness of valve.
1901.1.3 Determine the new face angle that value should be machined to.
1901.1.4 Determine oversize that cylinder is to be machined to.
1901.1.5 Determine the finish to which cylinder should be honed.
1901.1.6 Recondition and resize rods.
1901.1.7 Bore out valve guides, install new guides, ream to appropriate size for valve
1901.1.8 Surface cylinder head to appropriate finish per application.
1901.1.9 Inspect crankshaft for cracks, pits, abrasions and then polish or grind depending on condition of crankshaft.
1901.1.10 Determine which camshaft is to be used per application: determine camshaft bearing size and appropriate method to install cam bearings into motor block.
1901.1.11 Check passages and restrictions in oiling systems of motor.

Fundamentals of Machine Tool Technology

This course will introduce students to the basic fundamentals related to machine tool technology. Students will become familiar with safety, blueprint reading, layout and measuring skills, and various hand and power tools used in the machine shop.

Standard 1: Identify, explore, and evaluate career opportunities related to metals technology. (1903.S.1)

Metals Technology Objectives
Students will:
1903.1.1 Describe a variety of careers related to metals technology, and the training necessary to be successful in those careers.
1903.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of metals technology.
1903.1.3 Identify sources of information about careers in metals technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to machine tool technology. (1903.S.2)

Safety Rules Objectives
Students will:
1903.2.1 Recognize and follow general shop safety guidelines.
1903.2.2 Explain and demonstrate the proper use and care of tools, machines, and equipment in the metals laboratory.
1903.2.3 Demonstrate the proper selection and use of fire extinguishers.
1903.2.4 Identify, demonstrate proper use and care of, and wear all basic personal safety equipment.
1903.2.5 Describe safety precautions necessary when using hazardous materials.

Standard 3: Demonstrate measuring skills and techniques used in machine tool technology. (1903.S.3)

Machine Tool Technology Objectives
Students will:
1903.3.1 Identify and properly use a variety of measuring equipment, including: a six inch rule, a 4R graduate rule, and a vernier caliper.
1903.3.2 Demonstrate use of inside and outside micrometer.

Standard 4: Interpret blueprints. (1903.S.4)

Blueprints Objectives
Students will:
1903.4.1 Draw sketches for jobs with notes and symbols.
1903.4.2 Interpret technical orders, standards and specifications for work applications.
1903.4.3 Form materials to blueprint specifications.

Standard 5: Identify basic hand tools used in machine tool technology and perform bench work processes. (1903.S.5)

Basic Hand Tools Objectives
Students will:
1903.5.1 Choose the proper hand tools for given applications, describe the proper care and maintenance of each, and demonstrate adjustments possible with each tool.

1903.5.2 Identify and maintain work holding devices, taps, dies and hand held tools.
1903.5.3 Cut internal and external threads using tap and die.
1903.5.4 Remove a broken bolt and tap.

Standard 6: Perform filing and grinding tasks. (1903.S.6)

Filing and Grinding Tasks Objectives
Students will:
1903.6.1 Demonstrate safe use of a pedestal grinder and use it to grind a center punch point, a chisel point edge, and a twist drill.
1903.6.2 Inspect, dress and true a grinding wheel, and adjust wheel guard and tool rest on grinder.
1903.6.3 Using hand tools, cut and file a square workpiece to precision specifications.

Standard 7: Demonstrate basic band saw operations and use. (1903.S.7)

Basic Band Saw Operations Objectives
Students will:
1903.7.1 Clean, lubricate, and inspect a bandsaw for safe operation.
1903.7.2 Layout and cut off material using both a vertical and horizontal bandsaw.
1903.7.3 Select, install, cut and weld bandsaw blades.

Standard 8: Demonstrate basic drill press operations and use. (1903.S.8)

Basic Drill Press Operations Objectives
Students will:
1903.8.1 Clean, lubricate, and inspect a drill press for safe operation.
1903.8.2 Select, mount, and secure holding device for drill press.
1903.8.3 Perform tapping, countersinking, counter boring, and spot facing operations on drill press.

Standard 9: Demonstrate basic metal lathe operations and use. (1903.S.9)

Basic Metal Lathe Operations Objectives
Students will:
1903.9.1 Clean, lubricate, and inspect a metal lathe for safe operation.
1903.9.2 Mount work in universal lathe chuck, face workpiece, center drill workpiece.
1903.9.3 Center tool bit in lathe using tail stock.
1903.9.4 Perform setup using dial indicator.
1903.9.5 Use a pedestal grinder to shape and sharpen left and right hand cutting tools, grind a radius and cutting edge on a lathe tool kit.
1903.9.6 Perform a variety of lathe operations, including turn round stock to specific size, knurl a workpiece, and freehand form a workpiece.

Standard 10: Demonstrate basic milling machine operations and use. (1903.S.10)

Basic Milling Machine Operations Objectives
Students will:
1903.10.1 Clean, lubricate and inspect a milling machine for safe operation.
1903.10.2 Align vice, locate center of workpiece, and seat workpiece in vice on mill.
1903.10.3 Square stock to size, using a milling machine.

Machine Processes

This course will provide students with an introduction to metallurgy and advanced power tool skills related to machine tool technology.

Standard 1: Describe the structure and classifications of machining metals. (1905.S.1)

Machining Metals Objectives
Students will:
1905.1.1 Describe the open hearth, Bessemer converter, electric furnace, and basic oxygen process of making steel.
1905.1.2 Classify low, medium, and high carbon steel, and tool and die steels according to the SAE and AISI systems.
1905.1.3 Identify the carbon content of alloy metals using the spark test method.
1905.1.4 Classify aluminum according to the Aluminum Association four digit numbering code.

Standard 2: Perform advanced grinding techniques. (1905.S.2)

Grinding Techniques Objectives
Students will:
1905.2.1 Grind a slot in workpiece.
1905.2.2 Dress angle on grinding wheel.

Standard 3: Demonstrate advanced lathe operations. (1905.S.3)

Lathe Operations Objectives
Students will:
1905.3.1 Cut internal taper surface using taper attachment.
1905.3.2 Cut taper using tailstock off set.
1905.3.3 Chase internal right hand and left hand threads.
1905.3.4 Chase external and internal acme threads.
1905.3.5 Chase external pipe threads.
1905.3.6 Turn an eccentric on lathe.
1905.3.7 Machine a workpiece using face plate.

Standard 4: Demonstrate advanced milling operations. (1905.S.4)

Milling Operations Objectives
Students will:
1905.4.1 Machine woodruff keyway in workpiece.
1905.4.2 Bore and counterbore hole in workpiece.
1905.4.3 Drill holes to specified angles using angular indexing.
1905.4.4 Cut a sprocket using simple indexing.
1905.4.5 Machine a spline using index head.
1905.4.6 Machine a spur gear.

Standard 5: Demonstrate CNC machining operations. (1905.S.5)

CNC Matching Operations Objectives
Students will:
1905.5.1 Identify the various parts of CNC equipment and describe how it operates.
1905.5.2 Demonstrate setup procedure for and properly operate CNC equipment.
1905.5.3 Calculate CNC programming geometry problems.

1905.5.4 Analyze part symmetry for CNC machining.
1905.5.5 Write CNC programs using G and M codes.
1905.5.6 Write incremental and absolute CNC programs.
1905.5.7 Solve angles for CNC program.

Machining Processes and Applications

This course will provide students with intermediate hand and power tool skills related to machine tool technology.

Standard 1: Demonstrate intermediate measuring skills. (1907.S.1)

Measuring Skills Objectives
Students will:
1907.1.1 Perform measuring skills using vernier calipers.
1907.1.2 Scribe circles, radian, and parallel lines on a workpiece.

Standard 2: Demonstrate intermediate vertical band saw operations. (1907.S.2)

Vertical Band Saw Objectives
Students will:
1907.2.1 Layout and saw an angle using vertical bandsaw.
1907.2.2 Perform contour cutting on vertical bandsaw.

Standard 3: Demonstrate intermediate grinding operations. (1907.S.3)

Grinding Operations Objectives
Students will:
1907.3.1 Mount and balance a grinding wheel on pedestal grinder.
1907.3.2 Grind flat, vertical, and angular surfaces.
1907.3.3 Grind a workpiece square and parallel to precision specifications.

Standard 4: Demonstrate intermediate metal lathe operations. (1907.S.4)

Metal Lathe Objectives
Students will:
1907.4.1 Counterbore hole in a workpiece.
1907.4.2 Part off workpiece.
1907.4.3 Machine an external taper using a taper attachment.
1907.4.4 Turn a long shaft between centers.
1907.4.5 Indicate shaft in lathe using a steady rest.
1907.4.6 Align tailstock using a dial indicator.
1907.4.7 Machine internal and external o-ring grooves.

Standard 5: Demonstrate intermediate milling operations. (1907.S.5)

Milling Operations Objectives
Students will:
1907.5.1 End mill key seats in workplace.
1907.5.2 Drill equally spaced holes on a bolt circle.
1907.5.3 Machine slots in workpiece.
1907.5.4 Machine equally spaced slots using direct indexing.
1907.5.5 Machine a hexagon workpiece using simple indexing.
1907.5.6 Align milling machine head, center drill workpiece, drill hole, and ream hole in workpiece on mill.
1907.5.7 Set-up workpiece using clamps.
1907.5.8 Flycut workpiece on vertical mill.

Metal Trades Processes and Application

This course will introduce students to the basic fundamentals related to machine tool and welding technology. Students will develop advanced skills using various hand and power tools.

Standard 1: Demonstrate measuring skills and techniques. (1909.S.1)

Measuring Skills and Techniques Objective
Students will:
1909.1.1 Use a dial indicator properly.

Standard 2: Perform metal pressing operations. (1909.S.2)

Metal Pressing Operations Objectives
Students will:
1909.2.1 Bend and straighten parts using hydraulic iron worker.
1909.2.2 Set-up and brake workpiece using hydraulic press.
1909.2.3 Perform metal shear operations.

Standard 3: Perform power saw operations. (1909.S.3)

Power Saw Operations Objectives
Students will:
1909.3.1 Select speeds, feeds, and adjust power saw.
1909.3.2 Perform contour cuts using vertical band saw.

Standard 4: Perform metal lathe operations and procedures. (1909.S.4)

Metal Lathe Operations and Procedures Objectives
Students will:
1909.4.1 Perform drilling, tapping, reaming, counterboring and countersinking operations on a lathe.
1909.4.2 File and polish using lathe.
1909.4.3 Cut internal and external V threads.
1909.4.4 Cut internal and external tapers.

Standard 5: Perform milling machine operations and procedures. (1909.S.5)

Milling Machine Operations and Procedures Objectives
Students will:
1909.5.1 Perform side cutter operations.
1909.5.2 Demonstrate simplified indexing operation on milling machine.
1909.5.3 Cut key slots using milling machine.
1909.5.4 Perform slitting saw operation on milling machine.
1909.5.5 Perform slot milling operation.
1909.5.6 Set-up and align milling machine and holding devices.

Standard 6: Demonstrate CNC machining operations. (1909.S.6)

CNC Machining Operations Objectives
Students will:
1909.6.1 Identify the various parts of CNC equipment and describe how it operates.
1909.6.2 Demonstrate setup procedure for and properly operate CNC equipment.
1909.6.3 Calculate CNC programming geometry problems.

1909.6.4 Analyze part symmetry for CNC machining.
1909.6.5 Write CNC programs using G and M codes.
1909.6.6 Write incremental and absolute CNC programs.
1909.6.7 Solve angles for CNC program.

Standard 7: Demonstrate advanced Gas Metal Arc welding techniques. (1909.S.7)

Gas Metal Arc Objectives
Students will:
1909.7.1 Select, prepare, adjust, and operate Gas Metal Arc welding equipment.
1909.7.2 Prepare, position, and tack weld parts for Gas Metal Arc welding.
1909.7.3 Perform flat and vertical Gas Metal Arc welding positions.

Standard 8: Demonstrate advanced Gas Tungsten Arc welding techniques. (1909.S.8)

Gas Tungsten Arc Objectives
Students will:
1909.8.1 Operate Gas Tungsten Arc welding equipment to weld aluminum in flat position.
1909.8.2 Operate Gas Tungsten Arc welding equipment to weld steel in flat position.

Standard 9: Demonstrate basic Shielded Metal Arc welding. (1909.S.9)

Shielded Metal Arc Objectives
Students will:
1909.9.1 Set up and adjust Shielded Metal Arc welding equipment.
1909.9.2 Arc weld carbon steel in flat position.
1909.9.3 Perform Shielded Metal Arc weld of carbon steel in vertical and overhead position.

Block and Rock Laying

This course will introduce students to the basic fundamentals of block and rock laying. Students will become familiar with basic tools, equipment and techniques used in block and rock laying.

Standard 1: Install a block foundation. (1911.S.1)

Block Foundation Objectives
Students will:
1911.1.1 Describe how to locate the corners of a foundation wall on the footing from batter boards.
1911.1.2 Estimate materials needed for a foundation project.
1911.1.3 Lay out, bond, build and waterproof a foundation project.
1911.1.4 Describe and install wire reinforcement and lintels in a block wall.

Standard 2: Lay concrete block to the line. (1911.S.2)

Concrete Block Objectives
Students will:
1911.2.1 Define terms associated with laying block.
1911.2.2 Identify methods of putting up a line.
1911.2.3 Lay out a block wall, and lay block to the line using an established level.
1911.2.4 Discuss the importance of having uniform bed joints and head joints.

Standard 3: Lay block leads. (1911.S.3)

Block Leads Objectives
Students will:
1911.3.1 Write a paragraph describing the importance and purpose of laying block leads to the correct height, level and plumb.
1911.3.2 Estimate materials and build an outside and inside corner lead seven courses high.
1911.3.3 Build a block partition wall with control joints.

Standard 4: Lay stone. (1911.S.4)

Stone Objectives
Students will:
1911.4.1 Define terms associated with cut stone.
1911.4.2 Describe various types of stone, and the procedure for laying out stone.
1911.4.3 Select types of anchors used in setting stone.
1911.4.4 Identify methods of handling stone.
1911.4.5 List factors to consider when setting stone.
1911.4.6 Lay a stone wall.

Bricklaying

This course will introduce students to the basic fundamentals of bricklaying. Students will become familiar with basic tools, equipment and techniques used in bricklaying.

Standard 1: Tool brick and mortar joints. (1913.S.1)

Tool Brick and Mortar Joints Objectives
Students will:
1913.1.1 Identify the different types of jointers and their specific uses.
1913.1.2 Strike, brush, and polish the following joints: rake joints, squeeze joints, trowel struck joints and V-joints.
1913.1.3 Grind and repair a brick wall.

Standard 2: Lay brick to the line. (1913.S.2)

Brick Objectives
Students will:
1913.2.1 Define terms associated with laying brick to the line.
1913.2.2 Identify and demonstrate methods of putting up a line and setting a trig brick.
1913.2.3 Dry bond a wall.
1913.2.4 Lay brick to the line using established leads and corner poles, and discuss the importance of each.
1913.2.5 Discuss the importance of having a plumb bond.
1913.2.6 Discuss the purpose of wall ties and describe how to install them.

Standard 3: Construct brick corners. (1913.S.3)

Brick Corners Objectives
Students will:
1913.3.1 Define terms associated with laying racked-back leads, inside corners, outside return corners and toothed-out leads.
1913.3.2 Write a short paragraph describing the purposes of leads.
1913.3.3 Lay a racked back, pyramid, inside and outside return corner, toothed lead.

Standard 4: Lay different brick positions. (1913.S.4)

Brick Positions Objectives
Students will:
1913.4.1 Discuss the different meanings of bonding, and identify various types of bonds.
1913.4.2 Define terms associated with wall layout.
1913.4.3 Correctly identify and describe the six different brick positions.
1913.4.4 Lay a double wall that contains stretches, headers, soldiers, shiners, row locks and sailors.

Standard 5: Install brick paving. (1913.S.5)

Brick Paving Objectives
Students will:
1913.5.1 List the various types of bricks and pattern bonds in paving and flooring.
1913.5.2 Describe how brick paving and floors are laid with and without mortar.
1913.5.3 Lay various brick patterns within a 2' x 4' frame.

Standard 6: Build chimneys and fireplaces. (1913.S.6)

Chimneys and Fireplaces Objectives
Students will:
1913.6.1 Define terms associated with chimneys and fireplaces.
1913.6.2 Identify various types of fireplaces, and identify the basic parts of a fireplace.
1913.6.3 Discuss the factors to consider in constructing fireplaces and chimneys.
1913.6.4 Write a paragraph describing the procedure for buttering a firebrick.
1913.6.5 Describe the characteristics of a firebox, and properly construct one.
1913.6.6 Construct a fireplace.
1913.6.7 Form a corbel.

Standard 7: Construct a flight of steps. (1913.S.7)

Steps Objectives
Students will:
1913.7.1 Define terms related to the parts of a porch and steps.
1913.7.2 Describe the relationship between riser and tread and why it is important in building steps.
1913.7.3 Describe how brick steps are laid out and constructed, and lay out and build a set of brick steps.

Standard 8: Lay out and construct an arch. (1913.S.8)

Arch Objectives
Students will:
1913.8.1 Define terms associated with arch construction, and describe the major types of arches used today.
1913.8.2 Describe the theory and function of an arch.
1913.8.3 Describe how wood arch forms are constructed in arches.
1913.8.4 Lay out and construct a semi-circular arch.

Concrete Finishing

This course will apply the concepts, applications, and techniques necessary for various phases of concrete construction.

Standard 1: Understand concrete construction and finishing concepts. (1915.S.1)

Concrete Construction Objectives
Students will:
1915.1.1 Define terms associated with concrete construction.
1915.1.2 Identify the composition and characteristics of concrete.
1915.1.3 Identify the uses of concrete as a building material.
1915.1.4 Identify the effect of craftsmanship on finished concrete.
1915.1.5 Explain the concrete construction process.
1915.1.6 Identify site operation work requirements.
1915.1.7 Explain the career potentials in concrete construction and finishing.

Standard 2: Understand and apply safety used in concrete construction. (1915.S.2)

Safety Objectives
Students will:
1915.2.1 Describe and wear different types of safety gear for the work site.
1915.2.2 State the guidelines for dressing appropriately for concrete work.
1915.2.3 Describe how to safely handle concrete when forming, placing, curing, and finishing.
1915.2.4 Describe safety precautions to follow when working in extreme heat and cold.
1915.2.5 Describe safety precautions to follow when working with hazardous materials.
1915.2.6 Describe proper procedures for handling and maintaining concrete construction tools safely.

Standard 3: Analyze the properties of concrete. (1915.S.3)

Properties of Concrete Objectives
Students will:
1915.3.1 Describe the properties of concrete.
1915.3.2 Explain how the properties of concrete are used in construction.
1915.3.3 Determine how the ingredients of concrete influence mix, placement, finishing, durability, and performance.
1915.3.4 Describe quality-control tests on concrete ingredients, fresh concrete, and hardened concrete.
1915.3.5 Mix a test batch of concrete.
1915.3.6 Perform a slump test.

Standard 4: Identify tools and equipment used in concrete construction. (1915.S.4)

Tools and Equipment Objectives
Students will:
1915.4.1 Name the tools used in placing and finishing concrete.
1915.4.2 Name the power equipment used in placing and finishing concrete.
1915.4.3 Describe how each tool is use.
1915.4.4 Describe how the power equipment is used.
1915.4.5 Associate trade terms with the appropriate tools and equipment.

Standard 5: Prepare worksite for concrete placement. (1915.S.5)

Concrete Placement Objectives
Students will:
1915.5.1 Describe basic site layout using levels and measuring tools.
1915.5.2 Properly locate, grade, and build forms for horizontal placement.
1915.5.3 Perform compaction activities on subgrades.
1915.5.4 Describe various joints and where to locate them.
1915.5.5 Describe various reinforcements and how to place them.
1915.5.6 Describe information needed when ordering concrete.

Standard 6: Place concrete. (1915.S.6)

Place Concrete Objectives
Students will:
1915.6.1 Describe how concrete is conveyed and placed.
1915.6.2 Draw up a pre-placement checklist.
1915.6.3 Demonstrate the use of equipment and tools for placing concrete.
1915.6.4 Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form.
1915.6.5 Associate trade names with the appropriate processes and equipment.

Standard 7: Apply basic concrete finishing techniques. (1915.S.7)

Finishing Techniques Objectives
Students will:
1915.7.1 Describe the basic finishing process.
1915.7.2 Use the following finishing hand tools: float, edger, groover, and trowel.
1915.7.3 Mark and cut joints with a saw.
1915.7.4 Apply a broom finish.
1915.7.5 Apply a rubbing finish.
1915.7.6 Associate trade terms with the appropriate processes and equipment.

Standard 8: Curing and protecting concrete. (1915.S.8)

Curing and Protecting Concrete Objectives
Students will:
1915.8.1 Describe the process of curing concrete.
1915.8.2 Identify methods of curing concrete.
1915.8.3 Describe how each method is applied.
1915.8.4 Identify when each method is used.
1915.8.5 Associate trade terms with the appropriate processes and equipment.

Standard 9: Troubleshooting basic concrete construction problems. (1915.S.9)

Construction Problems Objectives
Students will:
1915. 9.1 Describe a basic troubleshooting methodology that can be used to identify a variety of concrete construction problems and their causes.
1915. 9.2 Identify problems with fresh concrete and describe ways to prevent them.
1915. 9.3 Identify different concrete defects such as crazing, cracking, dusting, scaling, popouts, and efflorescence, and describe ways to prevent them.

Foundations And Footings

This course will introduce students to the basic fundamentals of laying foundations and footings. Students will become familiar with basic tools, equipment and techniques used to lay foundations and footings.

Standard 1: Layout a foundation. (1917.S.1)

Foundation Objectives
Students will:
1917.1.1 Discuss the importance of accuracy in foundation layout.
1917.1.2 Describe how to square a foundation by finding the diagonal.
1917.1.3 Describe the important features of a foundation.
1917.1.4 Name the parts of a builders level and transit, and set up and adjust both properly.
1917.1.5 Lay out and square a foundation using a transit and the 6-8-10 method.
1917.1.6 Discuss the importance of the location, installation and use of batter boards.

Standard 2: Layout a footer. (1917.S.2)

Footer Objectives
Students will:
1917.2.1 Discuss the size of footings for various widths of block.
1917.2.2 Describe the two types of footings used for a foundation.
1917.2.3 Describe the use of steel reinforcement in concrete, and how a footing is placed and cured.
1917.2.4 Describe how to estimate materials for a footing.
1917.2.5 Estimate and prepare a material list for a footer.

Standard 3: Demonstrate knowledge of blueprint reading. (1917.S.3)

Blueprint Reading Objectives
Students will:
1917.3.1 Identify various types of working drawings, and describe the divisions found in a set of building plans.
1917.3.2 Measure accurately using an architects scale.
1917.3.3 Interpret a set of brick masonry specifications, listing major items found on the specifications and the items that may be shown in detail.
1917.3.4 Properly read a structural plan, a plan view, and a finish schedule.

Fundamentals of Masonry

This course will introduce students to the basic fundamentals in the masonry industry. Students will become familiar with basic tools, equipment and techniques used in masonry.

Standard 1: Identify, explore, and evaluate career opportunities related to masonry. (1919.S.1)

Career Opportunities Objectives
Students will:
1919.1.1 Describe a variety of careers related to masonry, and the training necessary to be successful in those careers.
1919.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of masonry.
1919.1.3 Identify sources of information about careers in masonry.

Standard 2: Demonstrate knowledge of basic blueprint reading. (1919.S.2)

Blueprint Reading Objectives
Students will:
1919.2.1 Interpret scale drawings.
1919.2.2 Define terms, abbreviations and symbols associated with basic blueprint reading.
1919.2.3 Demonstrate knowledge of specifications and codes.

Standard 3: Demonstrate safe work habits while working with masonry materials and equipment. (1919.S.3)

Safe Work Habits Objectives
Students will:
1919.3.1 Identify and practice safety rules used in the masonry lab.
1919.3.2 Complete a safety checklist.
1919.3.3 Identify safety practices related to the use of various hand and power masonry tools.

Standard 4: Identify and properly use various hand tools related to the masonry field. (1919.S.4)

Hand Tools Objectives
Students will:
1919.4.1 Identify and describe various masonry tools, and demonstrate how to use them properly.
1919.4.2 Explain the basic rules concerning the care of masonry hand tools.

Standard 5: Demonstrate proper and safe use of ladders and scaffolds. (1919.S.5)

Ladders and Scaffolds Objective
Students will:
1919.5.1 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.

Standard 6: Describe various masonry units and the manufacturing processes used to produce them. (1919.S.6)

Masonry Units Objectives
Students will:
1919.6.1 Describe the development of brick and how they are used today.
1919.6.2 Describe the methods of block manufacturing from early times to present.

1919.6.3 Match the description of various brick and block units to correct size of the units.
1919.6.4 List the different proportions and characteristics of brick.

Standard 7: Identify the different mortar types and their characteristics. (1919.S.7)

Mortar Objectives
Students will:
1919.7.1 Identify the various types of mortar used in masonry work.
1919.7.2 Describe admixtures and their purpose in masonry work.
1919.7.3 Describe the causes and prevention of efflorescence.

Standard 8: Interpret and read the various rules in masonry work. (1919.S.8)

Masonry Objectives
Students will:
1919.8.1 Describe the purpose of brick spacing and its purpose in spacing mortar joints.
1919.8.2 Describe the purpose of a modular rule and how it is used in relation to modular construction.

Standard 9: Properly mix and spread mortar. (1919.S.9)

Mortar Objectives
Students will:
1919.9.1 Define terms associated with spreading mortar.
1919.9.2 Proportion mortar ingredients for specific mixes, and mix to the proper consistency using a mortar hoe and a power mortar mixer.
1919.9.3 Identify different methods of picking up mortar from a board and pan.
1919.9.4 Distinguish between the correct and incorrect ways of holding a trowel and properly spread mortar.
1919.9.5 Label head and bed joints when given an illustration.
1919.9.6 Demonstrate the ability to spread mortar on a 2x4.

Fundamentals of Materials Distribution

This course will introduce students to the careers, skills and knowledge necessary to obtain employment in occupations related to preparing, accepting, checking and storing goods received for business and industry.

Standard 1: Identify, explore, and evaluate career opportunities related to materials handling and inventory control. (1921.S.1)

Career Opportunities Objectives
Students will:
1921.1.1 Describe a variety of careers related to materials handling and inventory control, and the training necessary to be successful in those careers.
1921.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of materials handling and inventory control.
1921.1.3 Identify sources of information about careers in materials handling and inventory control.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to materials handling and inventory control. (1921.S.2)

Safety Rules Objectives
Students will:
1921.2.1 Recognize and follow general shop safety guidelines.
1921.2.2 Identify, select and demonstrate proper use and care of all basic personal safety equipment.
1921.2.3 Demonstrate proper lifting techniques and describe injuries that may occur if these procedures are not followed.
1921.2.4 Demonstrate the proper selection and use of fire extinguishers.
1921.2.5 Describe safety precautions used when handling hazardous materials.
1921.2.6 Demonstrate first aid procedures for immediate care in a variety of injuries.

Standard 3: Prepare merchandise for shipment. (1921.S.3)

Shipment Objectives
Students will:
1921.3.1 Address packages, cartons, and containers, and deliver merchandise to proper station for shipment.
1921.3.2 Determine method of shipment, UPS charges, and truck charges.
1921.3.3 Build skids, pallets, and boxes.
1921.3.4 Obtain goods from stockroom or warehouse; inspect merchandise to ensure entire order can be accounted for.
1921.3.5 Prepare invoices and appropriate shipping forms.
1921.3.6 Prepare damaged goods claims and package damaged goods for reshipment.

Standard 4: Accept and check materials received. (1921.S.4)

Accept and Check Materials Objectives
Students will:
1921.4.1 Describe the procedure for assisting carrier in off-loading supplies.
1921.4.2 Check invoice against purchase order and number of cartons against bill of lading.
1921.4.3 Prepare overage, shortage and discrepancy (OS&D) report and record carrier name and carrier number on receiving report.
1921.4.4 Spot check cartons for damage.

Standard 5: Properly store goods received. (1921.S.5)

Store Goods Received Objectives

Students will:

1921.5.1 Arrange goods according to identification codes.
1921.5.2 Check descriptions of goods against invoices.
1921.5.3 Maintain and update master warehouse location plans.
1921.5.4 Move goods to proper stocking area (normal control, first-in/first-out).
1921.5.5 Open containers with proper tools.
1921.5.6 Provide secure storage for property that is classified, sensitive, radioactive, hazardous or flammable.
1921.5.7 Store goods in proper location (bins, racks, etc.).

Materials Distribution Equipment

This course will introduce students to various skills and knowledge necessary in moving goods for business and industry with manual and power equipment.

Standard 1: Demonstrate safe and efficient use of manual materials handling equipment. (1923.S.1)

Equipment Objectives
Students will:

1923.1.1 List and explain the uses of various kinds of material handling equipment.
1923.1.2 Properly operate a dolly, desk mover, file cabinet mover, and a barrel truck.
1923.1.3 Properly operate a four-wheeled platform truck.
1923.1.4 Properly operate a 5000 lb. manual pallet jack.
1923.1.5 Properly operate a manually operated banding machine and demonstrate the use of plastic wrap.

Standard 2: Demonstrate safe and efficient use of powered materials handling equipment. (1923.S.2)

Handling Equipment Objectives
Students will:

1923.2.1 Identify and explain the parts and controls of powered industrial trucks and manlift cages.
1923.2.2 Define and properly use forklift terms.
1923.2.3 Properly operate a stand up & reach fork truck (electric).
1923.2.4 Properly operate both an LPG/gas and an electric a sit down fork truck.
1923.2.5 Properly operate an electric order selector fork truck.
1923.2.6 Properly operate an electric pallet jack.
1923.2.7 List proper battery charging procedures and storage.
1923.2.8 List proper refueling procedures for LPG/gas powered fork trucks.
1923.2.9 Identify and describe the parts and controls of materials handling robots.
1923.2.10 Demonstrate basic robotic programming.

Materials Management

This course will introduce students to the preparation of printed data for materials handling, using a variety of inventorying equipment.

Standard 1: Perform computer operations related to maintaining an inventory. (1925.S.1)

Computer Operations Objectives
Students will:
1925.1.1 Demonstrate computer functions and start up procedures.
1925.1.2 Prepare receiving reports and purchase requisitions.
1925.1.3 Demonstrate data entry.
1925.1.4 Prepare printouts on inventory by number or descriptions and packing lists.
1925.1.5 Prepare printed packing lists, purchase orders, and invoices.
1925.1.6 Demonstrate inventory adjustments.
1925.1.7 Prepare vendor list, sales register, and customer lists.
1925.1.8 Edit accounts.
1925.1.9 Print price lists.
1925.1.10 Define computerized inventory terms.

Standard 2: Perform bar code inventory operations related to performance inventory procedures. (1925.S.2)

Bar Code Objectives
Students will:
1925.2.1 Demonstrate UPC bar code reader operations.
1925.2.2 List operational procedures to upload and download inventory.
1925.2.3 Demonstrate proper care and storage of bar code equipment.
1925.2.4 List proper procedures to print bar code labels.

Supervisory Skills In Warehousing

This course will instruct students in proper performance and execution of managerial duties in a warehouse.

Standard 1: Perform managerial duties within the warehouse. (1927.S.1)

Managerial Duties Objectives
Students will:
1927.1.1 Interpret policies, directives, or procedures for personnel.
1927.1.2 Plan layout of facilities and storage of goods.
1927.1.3 Prepare requisitions for in-house supplies or equipment.
1927.1.4 Supervise the accomplishment of work priorities.
1927.1.5 Supervise inventory of goods in the facility.
1927.1.6 Supervise receiving operations.
1927.1.7 Supervise shipping operations.
1927.1.8 Supervise storage of goods in the facility.

Standard 2: Perform personnel training duties within the warehouse. (1927.S.2)

Personnel Training Objectives
Students will:
1927.2.1 Prepare training and evaluation procedures for personnel.
1927.2.2 Role play an interview with a potential employee.
1927.2.3 Prepare employee selection criteria.
1927.2.4 Prepare and update employee portfolio.

Standard 3: Perform the administrative functions required in warehousing. (1927.S.3)

Administrative Functions Objectives
Students will:
1927.3.1 Adjust inventory records and complete inventory reports.
1927.3.2 Audit stock balance and consumption reports.
1927.3.3 Conduct on-going and periodic physical inventory.
1927.3.4 Make entries on the stock locator system cards to show changes in location of goods, and properly file cards.
1927.3.5 Prepare requisition and shipment documents.
1927.3.6 Post transaction data to stock control record cards.

Introduction to SQL and PL/SQL

This course offers students an extensive introduction to data-server technology. Students are taught to create and maintain database objects and to store, retrieve and manipulate data using the powerful SQL and PL/SQL programming languages. Students will create blocks of application code that can be shared by multiple forms, reports and data management applications. They will demonstrate this learning by revisiting their WebDB database project and use SQL in place of the GUI interface. Through the use of SQL and PL/SQL, students will gain fast, efficient and secure access to the database.

Standard 1: Demonstrate knowledge of SQL. (1931.S.1)

SQL Objectives
Students will:
1931.1.1 Identify the structural elements of a relational database table.
1931.1.2 List and describe the System Development Life Cycle.
1931.1.3 Describe the Oracle implementation of the Relational Database Management System RDBMS) and Object Relational Database Management System (ORDBMS).
1931.1.4 Explain how SQL and PL/SQL are used in the Oracle Product Set. Identify the advantages of PL/SQL.

Standard 2: Write basic SQL statements. (1931.S.2)

Write SQL Statements Objectives
Students will:
1931.2.1 List the capabilities of SQL SELECT statements.
1931.2.2 Execute a basic SELECT statement.
1931.2.3 Differentiate between SQL statements and SQL*Plus commands.

Standard 3: Restrict and sort data. (1931.S.3)

Restrict and Sort Data Objectives
Students will:
1931.3.1 Identify and model various types of entities.
1931.3.2 Identify naming and drawing conventions for entities.
1931.3.3 Sequence the steps that are necessary for creation of an entity.
1931.3.4 Analyze and model the relationships between entities.

Standard 4: Perform single row functions. (1931.S.4)

Row Functions Objectives
Students will:
1931.4.1 Perform calculations on data.
1931.4.2 Modify individual data items.
1931.4.3 Use character, number and date functions in SELECT statements.
1931.4.4 Format data and numbers for display purposes.
1931.4.5 Convert column data types.

Standard 5: Display data from multiple tables. (1931.S.5)

Multiple Tables Objectives
Students will:
1931.5.1 Construct SELECT statements to access data from more than one table using equality and

nonequality joins.

1931.5.2 Use outer joins through viewing data that generally does not meet a join condition.

1931.5.3 Join a table to itself.

Standard 6: Aggregate data using group functions. (1931.S.6)

Group Functions Objectives

Students will:

1931.6.1 Identify the available group functions and describe their use.

1931.6.2 Demonstrate the ability to group data through the use of the GROUP BY clause.

1931.6.3 Demonstrate the ability to include or exclude grouped rows by using the HAVING clause.

Standard 7: Demonstrate knowledge of subqueries. (1931.S.7)

Subqueries Objectives

Students will:

1931.7.1 Write a query with an embedded subquery.

1931.7.2 Evaluate and perform a multiple-column subquery.

1931.7.3 Describe and explain the behavior of subqueries when null values are retrieved.

1931.7.4 Create a subquery in a FROM clause.

Standard 8: Produce readable output with SQL* Plus and manipulate data. (1931.S.8)

Readable Output Objectives

Students will:

1931.8.1 Produce queries that require an input variable.

1931.8.2 Customize the SQL*Plus environment using SET commands for control.

1931.8.3 Produce more readable output through the use of the COLUMN and BREAK commands.

1931.8.4 Identify Data Manipulation Language (DML) and describe various DML statements.

1931.8.5 Utilize Data Manipulation Language (DML) through inserting, updating and deleting rows from a table.

1931.8.6 Control transactions using COMMIT and ROLLBACK statements.

Standard 9: Create and manage database objects. (1931.S.9)

Database Objects Objectives

Students will:

1931.9.1 Describe the main database objects.

1931.9.2 Create tables and alter their definitions.

1931.9.3 Describe the data types that can be used when specifying column definition.

Standard 10: Alter tables and constraints implementing views. (1931.S.10)

Alter Tables Objectives

Students will:

1931.10.1 Create, drop, rename and truncate tables using SQL*Plus.

1931.10.2 Identify and describe various constraints including NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY and CHECK.

1931.10.3 Create and maintain constraints including Adding, Dropping, Enabling, Disabling and Cascading.

1931.10.4 Recognize views and explain how they are created, how they retrieve data and how they perform DML operations.

Standard 11: Create and implement views, synonyms, indexes and other database objects. (1931.S.11)

Database Objects Objectives
Students will:
1931.11.1 Create views, retrieve data through a view, alter the definition of a view and drop a view.
1931.11.2 Categorize information by using Top-N queries to retrieve specified data.
1931.11.3 Identify the features of a sequence and display sequence values using a data dictionary view.
1931.11.4 Identify the characteristics of a cached sequence.
1931.11.5 Modify and remove a sequence using a SQL statement.
1931.11.6 Identify the features of private and public synonyms.
1931.11.7 Identify characteristics of an index and describe different types.
1931.11.8 Create and remove an index using a SQL statement.

Standard 12: Control user access and SQL workshop. (1931.S.12)

Control User Access Objectives
Students will:
1931.12.1 Identify the features of database security.
1931.12.2 Create users using SQL*Plus statements.
1931.12.3 Grant and Revoke object privileges using SQL*Plus.

Standard 13: Demonstrate knowledge of PL/SQL. (1931.S.13)

PL/SQL Objectives
Students will:
1931.13.1 List and describe the benefits of PL/SQL.
1931.13.2 Recognize the basic PL/SQL block and its sections.
1931.13.3 Declare PL/SQL variables and describe their significance.
1931.13.4 Execute a PL/SQL block.

Standard 14: Write executable statements working with composite datatype. (1931.S.14)

Executable Statements Objectives
Students will:
1931.14.1 Recognize the significance of the executable section and decide when to use it.
1931.14.2 Write PL/SQL statements in the executable section.
1931.14.3 Describe the rules of nested blocks.
1931.14.4 Identify and utilize appropriate coding conventions.
1931.14.5 Create a PL/SQL block that selects, inserts and updates data in a table.

Standard 15: Write control structures interacting with the Oracle server. (1931.S.15)

Control Structures Objectives
Students will:
1931.15.1 Identify the uses and types of control structures.
1931.15.2 Construct and execute an IF statement.
1931.15.3 Evaluate differences between loop statements.
1931.15.4 Control block flow through the use of nested loops and labels.

Standard 16: Write explicit cursors. (1931.S.16)

Cursors Objectives
Students will:
1931.16.1 Distinguish between an implicit and explicit cursor.
1931.16.2 Use a PL/SQL record variable.
1931.16.3 Write a cursor FOR loop.
1931.16.4 Determine when a FOR UPDATE clause in a cursor is required.
1931.16.5 Write a cursor that uses a subquery.

Standard 17: Demonstrate knowledge of handling exceptions review for the certification exam. (1931.S.17)

Handling Exceptions Objectives
Students will:
1931.17.1 Define PL/SQL exceptions.
1931.17.2 Recognize unhandled exceptions.
1931.17.3 List and use different types of PL/SQL exception handlers.
1931.17.4 Trap unanticipated errors.
1931.17.5 Describe the effect of exception propagation in nested blocks.
1931.17.6 Customize PL/SQL exception messages.

Java Database Applications

This course prepares students for taking the "Sun Certified Programmer for Java 2" exam. Students will also learn how to develop a Java database application, using JDeveloper for rapid application development. Approximately 6 weeks will be spent preparing for the syntax-and-rule-specific Java Certification exam.

Standard 1: Demonstrate knowledge of Java foundation classes. (1933.S.1)

Java Foundation Classes Objectives
Students will:
1933.1.1 Identify the five distinct parts of the JFC
1933.1.2 Demonstrate how Swing, AWT, and the JFC relate to each other.
1933.1.3 Identify the JFC-related packages, classes and interfaces.
1933.1.4 Use the Icon interface to annotate a component with an image.
1933.1.5 Establish a particular look and feel for a program's components.
1933.1.6 Implement a ToolTip to provide some simple, context-specific help.
1933.1.7 Develop borders around components.
1933.1.8 Use the four new Swing layouts.
1933.1.9 Recognize Swing event types and the new exception classes.
1933.1.10 Create a japplet.
1933.1.11 Create progress bars that display a current value.
1933.1.12 Present data in a two-dimensional format using tables.
1933.1.13 Create tabbed panes.
1933.1.14 Display data in a hierarchical structure using trees.
1933.1.15 Create split panes separated by a vertical or horizontal divider.
1933.1.16 Create pull-down menu items and attach them to a menu bar.
1933.1.17 Create mnemonics, or keyboard equivalents, and accelerators, keys pushed to activate the menu.
1933.1.18 Use event listeners to handle Action and Item events.
1933.1.19 Create popup menus and nested menus.
1933.1.20 Use Swing to create toolbar buttons for docked and floating toolbars.

Standard 2: Apply command line Applets. (1933.S.2)

Command Line Objectives
Students will:
1933.2.1 Write an applet using a subclass of the Applet class.
1933.2.2 Draw graphics with different colors and characters with different fonts.
1933.2.3 Identify the functions of the applet's execution methods.
1933.2.4 Load images and sounds in an applet.

Standard 3: Identify Applets and Jdeveloper. (1933.S.3)

Applets and Jdeveloper Objectives
Students will:
1933.3.1 Write an applet and embed it in an HTML page.
1933.3.2 Describe which methods are called by the browser, and when.
1933.3.3 Pass parameters into an applet from an HTML page.
1933.3.4 Deploy an applet using Jdeveloper.

Standard 4: Demonstrate Form Layout Manager. (1933.S.4)

Form Layout Manager Objectives
Students will:
1933.4.1 Write programs using the complex gridbag layout manager.
1933.4.2 Add swing containers to an application.
1933.4.3 Understand how layout managers operate.
1933.4.4 Write programs using the four basic layout manager types.
1933.4.5 Embed swing components into swing containers.
1933.4.6 Group swing components.

Standard 5: Demonstrate knowledge of Multithreading. (1933.S.5)

Multithreading Objectives
Students will:
1933.5.1 Distinguish between multithreading and multiprocessing.
1933.5.2 Design classes that extend the Thread class.
1933.5.3 Design applets that implement the Runnable interface.
1933.5.4 Avoid synchronization problems which can occur in multithreaded programs.
1933.5.5 Explain the basic concepts of multithreading.
1933.5.6 Create multiple threads.
1933.5.7 Use the synchronized keyword.
1933.5.8 Describe the life cycle of a thread.

Standard 6: Review for certification exam. (1933.S.6)

Certification Exam Objectives
Students will:
1933.6.1 Increase understanding of Java concepts.
1933.6.2 Become familiar with certification exam format and questions.

Standard 7: Access a database using JDBC. (1933.S.7)

JDBC Objectives
Students will:
1933.7.1 Describe the benefits of using Java and JDBC in conjunction with databases.
1933.7.2 Identify the package in the JDBC API that defines classes and interfaces for writing database applications in Java.
1933.7.3 Identify the importance of drivers to database connectivity and manipulation and the advantage of JDBC drivers.
1933.7.4 Identify Oracle JDBC drivers.
1933.7.5 Describe how Java can be used in all components of client-server and multitier database applications.
1933.7.6 Compare the use of Java in each component.
1933.7.7 Describe how Oracle8i and Oracle jserver implement each technology.
1933.7.8 Connect to a database.
1933.7.9 Write code to query and update a SQL database.
1933.7.10 Use stored procedures and precompiled statements.

Standard 8: Apply advanced JDBC topics and performance extensions. (1933.S.8)

Advanced JDBC Objectives
Students will:

1933.8.1 Define a JDBC driver and describe the Oracle JDBC drivers.
1933.8.2 Connect to a database using JDBC.

Java Programming

This course will provide the student with the fundamentals of Java programming, analysis, data types and operators, Jdeveloper, JavaApi, and how to control program flow.

Standard 1: Demonstrate knowledge of Java Programming Object-oriented Analysis. (1935.S.1)

Java Programming Objectives
Students will:
1935.1.1 Explain the principles and terminology of object oriented development.
1935.1.2 Apply a development process to move a project through analysis and design.
1935.1.3 Identify simple objects and classes.
1935.1.4 Describe relationships between objects.

Standard 2: Apply object-oriented analysis. (1935.S.2)

Analysis Objectives
Students will:
1935.2.1 Demonstrate the core concepts behind object-oriented programming: objects, methods, classes, and inheritance.
1935.2.2 Compare traditional project life cycles with iterative project life cycles.
1935.2.3 Describe the main activities of each phase in an OO project.
1935.2.4 Identify the popular tools currently available.
1935.2.5 List the strengths and weaknesses of Smalltalk, C++, and Java.
1935.2.6 Identify how they translate to code.
1935.2.7 Download and install the Java Development Kit. Set the PATH and CLASSPATH environment variables in a windows operating system.
1935.2.8 Begin to explore the Java API library.

Standard 3: Demonstrate knowledge of the Java language. (1935.S.3)

Java Language Objectives
Students will:
1935.3.1 Understand how the Java compiler, byte codes and Virtual Machine work together.
1935.3.2 Identify the ways in which Java is suited to network environments.
1935.3.3 Identify the components of the Java Software Development Kit (SDK) and their purpose.
1935.3.4 Identify the key elements of Java.
1935.3.5 Describe the Java Virtual Machine (JVM).
1935.3.6 Compare the use of Java for building applets and applications.
1935.3.7 Identify the key components of the Java Development Kit (JDK).
1935.3.8 Explain Java and the Oracle 8i database.
1935.3.9 Create a sample applet titled "Hello World".

Standard 4: Describe background object oriented programming working with classes and objects. (1935.S.4)

Background Object Objectives
Students will:
1935.4.1 Describe abstraction. Create an object-oriented hierarchy using "is-a" and "has-a" relationships.
1935.4.2 Describe object-oriented concepts: inheritance, encapsulation, polymorphism.
1935.4.3 Identify simple objects and classes.
1935.4.4 Identify internship possibilities and gather information about colleges supporting IT skills.

Standard 5: Define and use data types and operators. (1935.S.5)

Data Types and Operators Objectives
Students will:
1935.5.1 Describe primitive data types.
1935.5.2 Declare and initialize primitive variables.
1935.5.3 Use operators to manipulate the value in a primitive variable.
1935.5.4 Define and initialize arrays.
1935.5.5 Construct literal String values using quoted or unicode values.
1935.5.6 Identify when an object becomes eligible for garbage collection.

Standard 6: Demonstrate knowledge of Jdeveloper. (1935.S.6)

Jdeveloper Objectives
Students will:
1935.6.1 Create new workspaces, projects and applications.
1935.6.2 Build and execute Java applications
1935.6.3 Modify Java application source code.
1935.6.4 Demonstrate familiarity and develop comfort using jdeveloper design environment.
1935.6.5 Re-compile sample applications from previous sections.
1935.6.6 Research various colleges/universities that may offer additional IT courses.
1935.6.7 Identify businesses in local area that use Oracle software.

Standard 7: Apply controlling program flow techniques. (1935.S.7)

Flow Techniques Objectives
Students will:
1935.7.1 Use decision making constructs.
1935.7.2 Perform Loop operations through writing loops and nested loops.
1935.7.3 Write nested if/else and switch statements.
1935.7.4 Use logical operators in and identify valid arguments for if and switch statements.
1935.7.5 Use break and continue with and without labels.
1935.7.6 Debug an application using the Oracle developer debugger.

Standard 8: Discuss classes and objects as used in Java.

Java Objectives
Students will:
1935.8.1 Declare classes, instances of the classes and constants.
1935.8.2 Identify the two primary components make up the implementation of a class.
1935.8.3 Make appropriate use of the PUBLIC, PRIVATE and PROTECTED keywords.
1935.8.4 Write statements that declare a class, create instance variables of the given class and declare constants to store constant values.
1935.8.5 Implement nested classes.
1935.8.6 Determine the scope of a variable in a Java program.
1935.8.7 Identify the statement for casting primitive data types and object types.
1935.8.8 Copy the contents of an object to another object.
1935.8.9 Match the Math class methods with the values they return.

Standard 9: Discuss classes and objects as used in Java Api. (1935.S.9)

Java Api Objectives
Students will:

1935.9.1 Understand the organization of the Java Application Programming Interfaces (API).
1935.9.2 Recognize the packages that make up the Java Software Development Kit (SDK).
1935.9.3 Use the javadoc tool to generate API documentation from Java source files.
1935.9.4 Utilize the API documentation.
1935.9.5 Create new classes with Jdeveloper.
1935.9.6 Use packages to group related classes.
1935.9.7 Define instance variables and methods.
1935.9.8 Create objects and call methods.
1935.9.9 Declare fields and methods using the final and static modifiers.
1935.9.10 Understand how inner classes work.
1935.9.11 Use final and static to create constants.
1935.9.12 Define overloaded methods in a class.
1935.9.13 Provide constructors for a class.
1935.9.14 Use class variables and class methods where appropriate.
1935.9.15 Use initializers to initialize instance and class variables.

Standard 10: Demonstrate knowledge of datatypes/arrays. (1935.S.10)

Datatypes/Arrays Objectives
Students will:
1935.10.1 Define and initialize arrays.
1935.10.2 Construct literal String values using quoted or unicode values.
1935.10.3 Identify when an object becomes eligible for garbage collection.
1935.10.4 Apply all assignment, arithmetic, relational, bitwise, and logical operators.
1935.10.5 Understand how type conversion occurs when using operators.
1935.10.6 Create and manipulate strings in Java.
1935.10.7 Use wrapper classes to convert strings to primitives and primitives to strings.
1935.10.8 Implement resizable arrays - vectors.

Standard 11: Demonstrate the use of inheritance. (1935.S.11)

Inheritance Objectives
Students will:
1935.11.1 Define inheritance and use inheritance to define new classes.
1935.11.2 Explain how to use polymorphism in java classes.
1935.11.3 Identify when and how a default constructor is created for a class.
1935.11.4 Know how to use the instance of operator when casting class objects.
1935.11.5 Override methods in the superclass.

Standard 12: Identify abstract classes and interfaces. (1935.S.12)

Classes and Interfaces Objectives
Students will:
1935.12.1 Define abstract classes and abstract methods.
1935.12.2 Declare classes using the abstract modifier.
1935.12.3 Define and implement interfaces.

Standard 13: Apply knowledge of handling exceptions. (1935.S.13)

Handling Exceptions Objectives
Students will:
1935.13.1 Handle standard Java exceptions.
1935.13.2 Explain the basic concepts of exception handling.
1935.13.3 Write programs using try, catch and finally blocks.

1935.13.4 Create your own exception classes

Standard 14: Apply file input and output. (1935.S.14)

File Input and Output Objectives
Students will:
1935.14.1 Read from and write to the console.
1935.14.2 Create programs that read and write text and data files.
1935.14.3 Use Input and Output Streams.
1935.14.4 Write programs that operate on files and directories.
1935.14.5 List the contents of a directory.

Standard 15: Use the Java Foundation Class Abstract Window Toolkit. (1935.S.15)

Toolkit Objectives
Students will:
1935.15.1 Understand the use and organization of the AWT.
1935.15.2 Understand the relationship between the Abstract Window Toolkit (AWT) and the Java Foundation Classes (JFC).
1935.15.3 Use the Component and Container classes.
1935.15.4 Add Swing components to an application.
1935.15.5 Provide event handlers for common types of events.
1935.15.6 Write event handlers for different kinds of events.
1935.15.7 Determine when and how to use Event Adapters.
1935.15.8 Identify the cause of window events.
1935.15.9 Create buttons and labels.
1935.15.10 Write programs using textfields and Text Areas.
1935.15.11 Demonstrate how Text Component Events work.
1935.15.12 Explain parent and child components.
1935.15.13 Demonstrate the difference between the update(), paint() and repaint() methods.
1935.15.14 Use canvases to provide an area for drawing.
1935.15.15 Differentiate between the Graphics and Image classes.
1935.15.16 Use Frames.
1935.15.17 Create Menus and Dialog Boxes.
1935.15.18 Utilize Choice Menus and Scroll Bars.
1935.15.19 Manage the Font and fontmetrics classes.

Oracle-Database Fundamentals

This course is primarily conceptual, and covers the data requirements and business rules for the design of a relational database. As the first phase of the Academy curriculum, this course will provide the foundation for future software engineers or database administrators.

Standard 1: Provide an introduction to the Internet academy. (1937.S.1)

Internet Academy Objectives
Students will:
1937.1.1 Cite examples of jobs, salary, and opportunities a student will have as a result of Oracle certification.
1937.1.2 Describe the role a database plays in a business and predict its evolution.
1937.1.3 Demonstrate the difference between "data" and "information".
1937.1.4 Understand the importance of clear communication when discussing business information requirements.
1937.1.5 Experiment with web-based e-mail and explain how these services use a database.

Standard 2: Provide an overview of database development. (1937.S.2)

Database Development Objectives
Students will:
1937.2.1 Identify and analyze the phases of the Database Development Process.
1937.2.2 Explain what Conceptual Data Modeling and Database Design involve.
1937.2.3 Compare Database Development Process with that of the Application Development Process.

Standard 3: Demonstrate basic conceptual data modeling. (1937.S.3)

Basic Conceptual Data Modeling Objectives
Students will:
1937.3.1 Identify and model various types of entities.
1937.3.2 Identify naming and drawing conventions for entities.
1937.3.3 Sequence the steps that are necessary for creation of an entity.
1937.3.4 Analyze and model the relationships between entities.
1937.3.5 Analyze and model attributes.
1937.3.6 Identify unique identifiers for each entity.
1937.3.7 Develop an Entity Relationship diagram tagging attributes with optionally.
1937.3.8 Create models and ER diagrams from user information requirements and interviews.
1937.3.9 Begin to differentiate between One-to-Many, Many-to-Many and One-to-One relationships.
1937.3.10 Identify relationship between two entities by reading a given diagram.
1937.3.11 Create a relationship between instances of the same entity.
1937.3.12 Read an Entity Relationship Model in order to validate it.

Standard 4: Apply advanced conceptual data modeling. (1937.S.4)

Advanced Conceptual Data Modeling Objectives
Students will:
1937.4.1 Identify the significance of an attribute that has more than one value for each entity instance.
1937.4.2 Evaluate appropriate methods of storing validation rules for attributes.
1937.4.3 Recognize unique identifiers inherited from other entities.
1937.4.4 Sequence the steps involved in resolving a Many-to-Many relationship.
1937.4.5 Validate that an attribute is properly placed based upon its dependence on its entity's Unique Identifier (UID).

1937.4.6 Sequence the steps involved in resolving a Many-to-Many relationship.
1937.4.7 Validate that an attribute is properly placed based upon its dependence on its entity's Unique Identifier (UID).
1937.4.8 Resolve Many-to-Many relationships with intersection entities.
1937.4.9 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
1937.4.10 Create exclusive entities and relationships by using subtypes and arcs, respectively.
1937.4.11 Identify initial layout for presentation and generate a list of action items for members of group.

Standard 5: Apply advanced conceptual data modeling. (1937.S.5)

Advanced Conceptual Data Modeling Objectives
Students will:
1937.5.1 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
1937.5.2 Develop an ER Model using subtypes, supertypes and an exclusive arc.

Standard 6: Demonstrate adding complexity to an ERM. (1937.S.6)

Entity Relationship Model Objectives
Students will:
1937.6.1 Revise an Entity Relationship Model according to the diagramming techniques covered.
1937.6.2 Formulate reasons for holding historical data.
1937.6.3 Recognize and resolve Fan Traps and Chasm Traps.
1937.6.4 Differentiate between transferable and non-transferable relationships.
1937.6.5 Deliver a professional, formal business style presentation.
1937.6.6 Evaluate and critique presentation layout, design and performance.

Standard 7: Explain relational database concepts and initial database design. (1937.S.7)

Database Concepts and Design Objectives
Students will:
1937.7.1 Describe a relational database and how it is different from other databases.
1937.7.2 Define primary keys and foreign keys and their describe purpose.
1937.7.3 Describe what data integrity refers to and list some constraints.
1937.7.4 Explain how Database Design fits into the Database Development Process.
1937.7.5 Translate an Entity-Relationship Model into a relational database design.
1937.7.6 Document a database design using Table Instance charts.

Standard 8: Initial Database Design and Normalization (1937.S.8)

Design and Normalization Objectives
Students will:
1937.8.1 Demonstrate ability to implement 6 steps for mapping E-R Models.
1937.8.2 Document an initial database design on Table Instance Charts.
1937.8.3 Recognize raw data and evaluate the steps for creating a data group in unnormalized Form (UNF).

Standard 9: Demonstrate the technique of normalization. (1937.S.9)

Normalization Objectives
Students will:
1937.9.1 Differentiate between unnormalized data and normalized.
1937.9.2 Move data from an unnormalized form through to a Third Normal Form.

1937.9.3 Demonstrate ability to test data groups for Third Normal Form compliance.
1937.9.4 Identify optimized data groups from given groups of normalized data.
1937.9.5 Illustrate their personal folder using WebDB and altering the navigation bar, banner and content area.

Standard 10: Perform table normalization. (1937.S.10)

Table Normalization Objectives
Students will:
1937.10.1 Compare the Normalization and Entity Relationship Modeling (ERM) techniques in terms of strengths and weaknesses.
1937.10.2 Further define normalization and explain its benefits.
1937.10.3 Place tables in Third Normal Form.
1937.10.4 Explain how conceptual data modeling rules ensure normalized tables.
1937.10.5 Specify referential integrity constraints and design indices.

Standard 11: Review Data Modeling and Design and Introduction to WebDB (1937.S.11)

WebDB Objectives
Students will:
1937.11.1 Evaluate the transformation of business requirements into an initial layout and design for a database.
1937.11.2 Construct simple web page design for personal work folder.
1937.11.3 Evaluate existing web sites and determine quality of design.

Standard 12: Utilize WebDB and Building a Database Project. (1937.S.12)

Building A Database Project Objectives
Students will:
1937.12.1 Formulate a plan of action for a Database Project.
1937.12.2 Normalize an ERM to the Third Normal Form (TNF).
1937.12.3 Create a table in the database using webdb.
1937.12.4 Demonstrate ability to edit tables using webdb.
1937.12.5 Create forms that will display the table components created with webdb.

Standard 13: Work on database projects. (1937.S.13)

Database Projects Objectives
Students will:
1937.13.1 Create a website that displays the Database Project home using webdb.
1937.13.2 Link the web site to create a web-enabled interface to an Oracle database.
1937.13.3 Edit the forms created with webdb and specify appropriate field labels for data entry.
1937.13.4 Evaluate and generate criteria for a formal, business presentation.
1937.13.5 Construct a persuasive group presentation using the guidelines set forth in class.

Standard 14: Perform database presentations. (1937.S.14)

Perform Database Presentations Objectives
Students will:
1937.14.1 Deliver a formal business presentation for the class that discusses an Entity-Relationship Model and Initial Database Design.
1937.14.2 Demonstrate the functionality of the database and the layout/design capabilities of webdb.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Demonstrate leadership and communication skills. (1941.S.1)

Leadership and Communication Skills Objectives
Students will:
1941.1.1 Utilize record-keeping skills in work-based experience programs (SAE).
1941.1.2 Identify appropriate career opportunities in the floriculture industry.
1941.1.3 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
1941.1.4 Develop personal relation and communication skills.
1941.1.5 Describe employment and floriculture industry ethics.

Standard 2: Utilize principles of design to critique floral designs. (1941.S.2)

Floral Designs Objectives
Students will:
1941.2.1 Utilize floriculture principles, elements and theory of design.
1941.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
1941.2.3 Explain the concepts and use of color.

Standard 3: Identify and maintain cut flowers and greens. (1941.S.3)

Cut Flowers and Greens Objectives
Students will:
1941.3.1 Identify and classify flowers and foliage.
1941.3.2 List the techniques to maintain optimum flower and foliage quality.

Standard 4: Manipulate floral materials and supplies. (1941.S.4)

Floral Materials and Supplies Objectives
Students will:
1941.4.1 Identify the basic mechanics and supplies used in floral design.
1941.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
1941.4.3 Demonstrate construction of bows.

Standard 5: Design product in selected specialty areas. (1941.S.5)

Specialty Areas Objectives
Students will:
1941.5.1 Design boutonnieres and corsages.
1941.5.2 Identify concepts in floral design of holiday arrangements.
1941.5.3 Identify designs for weddings and receptions.
1941.5.4 Recognize practice in sympathy floral designs.
1941.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.
1941.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Develop floral operations and management strategies. (1941.S.6)

Floral Operations and Management Strategies Objectives

Students will:

1941.6.1 Develop skills in retail sales using various selling techniques.
1941.6.2 Develop a visual merchandising plan to project the right image.
1941.6.3 Identify the components and the importance of a floral delivery system.
1941.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts include: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Demonstrate leadership development (1943.S.1)

Leadership Development Objectives
Students will:
1943.1.1 Utilize record-keeping skills in work-based experience programs.
1943.1.2 Develop and exhibit communication skills.
1943.1.3 Draft and complete a resume, complete a job application, and demonstrate job seeking/keeping skills.
1943.1.4 Demonstrate personal and social skills.
1943.1.5 Research career opportunities in the greenhouse management industry.

Standard 2: Identify greenhouse designs, operation and maintenance. (1943.S.2)

Greenhouse Objectives
Students will:
1943.2.1 Identify different greenhouse parts and compare types of structures and coverings.
1943.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
1943.2.3 Diagram operational systems in the greenhouse operation.
1943.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Develop plant classification and identification skills. (1943.S.3)

Plant Classification and Identification Skills Objectives
Students will:
1943.3.1 Describe the natural classification system for the plant kingdom.
1943.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Develop skill in environmental control and plant growth. (1943.S.4)

Environmental Control And Plant Growth Objectives
Students will:
1943.4.1 Describe the plant processes involved with plant growth and development.
1943.4.2 List plant growth regulators and document their effects on plants.
1943.4.3 Explain how essential elements become available for plant use.
1943.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Identify greenhouse media and containers. (1943.S.5)

Greenhouse Media and Containers Objectives
Students will:
1943.5.1 Research the components of media and amendments.
1943.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
1943.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Identify plant processes and propagation. (1943.S.6)

Plant Processes and Propagation Objectives
Students will:
1943.6.1 Perform methods of propagating plants.
1943.6.2 Manipulate total environment from juvenile to mature plant.
1943.6.3 Describe plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identify and control disease, insects, and weeds. (1943.S.7)

Control Disease, Insects and Weeds Objectives
Students will:
1943.7.1 Identify and exhibit guidelines for pesticide use.
1943.7.2 Practice integrated pest management procedures.
1943.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Develop skills in greenhouse business management. (1943.S.8)

Greenhouse Business Objectives
Students will:
1943.8.1 Explore and discuss the various types of records kept in a greenhouse business.
1943.8.2 Use computers to solve problems related to greenhouse management.
1943.8.3 Describe the methods and determine the values and limitations of effective advertising.
1943.8.4 Develop a plan for profitable sales techniques.
1943.8.5 Record receipts and expenditures.

Standard 9: Safely conduct laboratory investigation. (1943.S.9)

Conduct Laboratory Investigation Objectives
Students will:
1943.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1943.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1943.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1943.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Apply technology to real world problems in greenhouses. (1943.S.10)

Technology in Greenhouses Objectives
Students will:
1943.10.1 Use computers and the World Wide Web (WWW) to solve problems related to work-based experience programs in greenhouses, locate, evaluate, and collect information from a variety of sources related to greenhouse technology, develop positive attitude, support lifelong learning, collaboration, personal pursuits, and productivity.
1943.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1943.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.
1943.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Demonstrate process/workplace skills. (1943.S.11)

Process/Workplace Skills Objectives

Students will:

1943.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1943.11.2 Explore careers available in greenhouse technology.

1943.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

1943.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1943.11.5 Demonstrate correct language usage in all oral and written work.

1943.11.6 Perform effectively in both leadership and non-leadership roles.

1943.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

1943.11.8 Participate as a team member to complete a variety of assignments.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Demonstrate leadership development. (1945.S.1)

Leadership Development Objectives
Students will:
1945.1.1 Participate in a student organization and its components.
1945.1.2 Utilize record-keeping skills in work-based experience programs.
1945.1.3 Develop and exhibit communication skills.
1945.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
1945.1.5 Demonstrate personal and social skills.
1945.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Perform plant classification and identification. (1945.S.2)

Plant Classification And Identification Objectives
Students will:
1945.2.1 Describe the natural classification system for the plant kingdom.
1945.2.2 Identify plant species and explore their benefit to people.
1945.2.3 Identify and research plants that are important to the greenhouse industry.
1945.2.4 Describe the plant processes involved with plant growth and development.
1945.2.5 List plant growth regulators and document their effects on plants.
1945.2.6 Explain how essential elements become available for plant use.
1945.2.7 Identify and document the effects of environmental factors on plant growth.
1945.2.8 Compare and contrast types of plant-growing media.
1945.2.9 Determine appropriate amendments for optimum plant growth.
1945.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Identify levels of plant processes and propagation. (1945.S.3)

Plant Processes And Propagation Objectives
Students will:
1945.3.1 Perform methods of propagating plants.
1945.3.2 Manipulate total environment from juvenile to mature plant.
1945.3.3 Identify plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Perform pest management. (1945.S.4)

Pest Management Objectives
Students will:
1945.4.1 Explain and apply the concepts of integrated pest management.
1945.4.2 Identify safety guidelines for tools, equipment and pesticide use.
1945.4.3 Identify pests and evaluate control methods according to label interpretation.
1945.4.4 Recognize, calibrate and operate pesticide application equipment
1945.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
1945.4.6 Interpret federal and state pesticide laws.

Standard 5: Identify the various specialty areas in horticulture. (1945.S.5)

Horticulture Objectives

Students will:

1945.5.1 Explore professions in floriculture and understand the scope of job opportunities.

1945.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.

1945.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.

1945.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.

1945.5.5 Explore professions in nursery production and understand job requirements.

1945.5.6 Demonstrate techniques and procedures used in the nursery production industry.

1945.5.7 Research careers in the landscape and turf industry.

1945.5.8 Perform basic landscape design, plantings and maintenance tasks.

1945.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Safely conduct laboratory investigation. (1945.S.6)

Laboratory Investigation Objectives

Students will:

1945.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1945.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1945.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1945.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to real world problems in horticulture. (1945.S.7)

Technology Objectives

Students will:

1945.7.1 Use computers and the World Wide Web (WWW) to solve problems related to experience programs in horticulture, locate, evaluate, and collect information from a variety of sources related to horticulture, develop a positive attitude toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.

1945.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1945.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.

1945.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Demonstrate process/workplace skills. (1945.S.8)

Process/Workplace Skills Objectives

Students will:

1945.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1945.8.2 Explore careers available in horticulture.

1945.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.

1945.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1945.8.5 Demonstrate correct language usage in all oral and written work.
1945.8.6 Perform effectively in both leadership and non-leadership roles.
1945.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
1945.8.8 Participate as a team member to complete a variety of assignments.

Landscape Design and Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, Students will: implement the plan.

Standard 1: Demonstrate leadership and interpersonal skills. (1947.S.1)

Leadership and Interpersonal Skills Objectives
Students will:
1947.1.1 Write, deliver and evaluate a speech and/or presentation.
1947.1.2 Explore careers in the landscape industry.
1947.1.3 Determine appropriate job seeking and keeping skills.
1947.1.4 Describe ethical conduct.
1947.1.5 Use record-keeping skills in work-based experience programs.

Standard 2: Recognize basic landscape design. (1947.S.2)

Landscape Design Objectives
Students will:
1947.2.1 Determine environmental requirements for landscape plant materials.
1947.2.2 Recognize the appropriate plants for landscape use.
1947.2.3 Interpret landscape symbols for a landscape plan.
1947.2.4 Operate computer assisted design programs.
1947.2.5 Demonstrate drafting skills needed in a landscape plan.

Standard 3: Use safety in operation of horticulture tools and equipment. (1947.S.3)

Horticulture Tools and Equipment Objectives
Students will:
1947.3.1 Identify and properly use horticulture tools and equipment.
1947.3.2 Follow appropriate safety procedures and policies.
1947.3.3 Interpret and follow safety information from equipment manuals.
1947.3.4 Maintain and adjust safety devices.
1947.3.5 Service tools and equipment as to manufactures specifications.
1947.3.6 Operate equipment under job site conditions.

Standard 4: Implement principles of landscape design. (1947.S.4)

Principles of Landscape Design Objectives
Students will:
1947.4.1 Prepare an area to be landscaped.
1947.4.2 Construct walkways and landscape structures.
1947.4.3 Install balled and burlapped, containerized and bare root plantings.
1947.4.4 Install herbaceous landscape plants.
1947.4.5 Place edging materials.
1947.4.6 Mulch a landscape site.
1947.4.7 Install turf areas.
1947.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. Students will: understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Demonstrate leadership and interpersonal skills. (1949.S.1)

Leadership and Interpersonal Skills Objectives
Students will:
1949.1.1 Identify communication skills.
1949.1.2 Identify interview and employment readiness skills.
1949.1.3 Draft a resume.

Standard 2: Demonstrate safe use and operation of horticulture tools and equipment. (1949.S.2)

Horticulture Tools and Equipment Objectives
Students will:
1949.2.1 Identify and properly use horticulture tools and equipment.
1949.2.2 Follow appropriate safety procedures and policies.
1949.2.3 Interpret and follow safety information from equipment manuals.
1949.2.4 Maintain and adjust safety devices.
1949.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
1949.2.6 Operate equipment under job site conditions.
1949.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Practice safe use of pest management techniques. (1949.S.3)

Pest Management Objectives
Students will:
1949.3.1 Identify, calibrate, and properly use equipment.
1949.3.2 Identify and use personal safety equipment and protective clothing.
1949.3.3 Identify pests and tbe appropriate control techniques.
1949.3.4 Introduce Integrated Pest Management (IPM) techniques.
1949.3.5 Interpret pesticide labels and proper use as instructed.
1949.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Practice proper landscape maintenance techniques. (1949.S.4)

Landscape Objectives
Students will:
1949.4.1 Determine and follow appropriate lawn care practices.
1949.4.2 Aerate and dethatch turf areas.
1949.4.3 Determine and implement irrigation needs for turf and landscaped areas.
1949.4.4 Identify appropriate soil testing procedures.
1949.4.5 Over-seed, lime, and fertilize as deemed necessary.
1949.4.6 Determine and implement proper pruning timelines and practices.
1949.4.7 Maintain landscape edging materials.
1949.4.8 Mulch landscape planting.
1949.4.9 Maintain landscape structures.
1949.4.10 Describe appropriate winter protection.

ProStart I

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete 400 hour off-campus, paid internship. This first course focuses on the basics of preparing and service safe food, preventing accidents, using foodservice equipment and preparing certain types of foods. It also addresses the business topics of human relations, customer service, controlling costs and certain math concepts.

Standard 1: Prepare for a successful career in foodservice management. (1951.S.1)

Foodservice Management Objectives
Students will:

1951.1.1 Recognize how the foodservice industry provides a unique workplace environment.
1951.1.2 Describe the importance of service to success in foodservice
1951.1.3 Describe the elements of excellent service.
1951.1.4 Identify ways to speak to customers and coworkers.
1951.1.5 Identify career opportunities within the foodservice industry.
1951.1.6 Describe the steps in looking for a job.
1951.1.7 Complete the necessary documents for a job interview including the resume, cover letter, and application.
1951.1.8 Participate in a job interview.

Standard 2: Prepare and serve safe food. (1951.S.2)

Safe Food Objectives
Students will:

1951.2.1 Demonstrate proper sanitary procedures for use in food service.
1951.2.2 Show how contamination and cross-contamination is most likely to occur.
1951.2.3 List the major causes of foodborne illnesses, and describe potentially hazardous foods.
1951.2.4 Describe the micro-organisms that cause foodborne illnesses and the conditions in which they thrive.
1951.2.5 Demonstrate safe and proper procedures for receiving, storing, preparing, holding, and serving food.
1951.2.6 Describe ways to prevent infestation by pests.

Standard 3: Practice safe workplace habits. (1951.S.3)

Safe Workplace Objectives
Students will:

1951.3.1 Demonstrate proper safety procedures commonly used in foodservice operations.
1951.3.2 Describe the role of OSHA regulations and explain the Hazard Communication Standard requirements for employers.
1951.3.3 Demonstrate proper procedures for reducing accidents involving fire, slips, trips, falls, lifting and carrying, cuts and equipment.

Standard 4: Demonstrate the basics food preparation. (1951.S.4)

Food Preparation Objectives

Students will:

1951.4.1 Describe the various liquid and dry cooking methods and the foods to which they are best suited.

1951.4.2 Read and follow standardized recipes, describing their components and functions, and convert them to smaller and larger quantities.

1951.4.3 Explain the functions of different types of knives and demonstrate their proper use.

1951.4.4 Identify the tools commonly used in food service for wet and dry measure and demonstrate understanding of equivalence of standard American and metric measures.

1951.4.5 Define common cooking and foodservice terms.

Standard 5 :Operate foodservice equipment safely and effectively. (1951.S.5)

Foodservice Equipment Objectives

Students will:

1951.5.1 List and describe the equipment commonly used in the receiving, storage, food preparation, baking, holding and service, bar, dishwashing and waste disposal areas.

1951.5.2 List and describe the measuring utensils, hand tools, knives, pots and pans commonly used in a food service operation.

1951.5.3 Discuss how to troubleshoot the maintenance and repair of mixers, slicers, steamers, broilers, ranges, grills, fryers, ovens, food warmers, coffee urns, dishwashers and waste disposal systems.

1951.5.4 Discuss the role of the health inspector and how managers get ready for inspections.

Standard 6: Discuss the role of nutrition in a food service operations. (1951.S.6)

Nutrition in Food Service Operations Objectives

Students will:

1951.6.1 Explain the role of Recommended Dietary Allowances (RDAs) and the Food Guide Pyramid planning healthful meals.

1951.6.2 Plan interesting, appealing and nutritionally balanced meals.

1951.6.3 Demonstrate cooking methods and identify recipes that preserve nutrients in quantity cooking.

Standard 7: Prepare sandwiches and breakfast foods. (1951.S.7)

Sandwiches and Breakfast Foods Objectives

Students will:

1951.7.1 Explain the roles of the production sheet, daily food cost sheet, sales history, and sales mix record in quantity food production.

1951.7.2 Perform total food cost and food cost percentage calculations.

1951.7.3 Determine the total cost and portion cost of standardized recipes.

1951.7.4 Explain the roles of the three components of a sandwich: bread, spread and filling.

1951.7.5 Compare and contrast the various types of sandwich: simple hot, open-faced, deep-fried, simple cold, tea and canapé.

1951.7.6 Set up a safe, sanitary, and efficient sandwich station.

1951.7.7 List the various forms in which milk is available and define pasteurize and homogenize.

1951.7.8 Compare and contrast current, aged, and processed cheeses and give examples of each.

1951.7.9 Describe the methods for cooking eggs: boiled, baked, shirred, poached, fried, scrambled, deviled, omelet, quiche, and soufflé.

1951.7.10 Prepare common breakfast food: pancakes and similar foods, eggs, breakfast cereals and breakfast meats.

Standard 8: Prepare salads and garnishes. (1051.S.8)

Salads and Garnishes Objectives
Students will:
1951.8.1 Discuss characteristic of the various ingredients that can be used to make both common and unusual salads.
1951.8.2 Prepare and store salads properly.
1951.8.3 Demonstrate techniques used to prepare garnishes
1951.8.4 Discuss common salad dressings and condiments.

Standard 9: Understand personnel management techniques. (1951.S.9)

Personnel Management Techniques Objectives
Students will:
1951.9.1 Demonstrate quality customer service techniques.
1951.9.2 Describe the elements involved in staff planning, recruiting, interviewing, and selecting employees
1951.9.3 Discuss effective methods of motivating and retaining employees
1951.9.4 Show techniques used to conduct and effective employee evaluation.

Standard 10: Prepare fruits and vegetables. (1951.S.10)

Fruits and Vegetables Objectives
Students will:
1951.10.1 Describe and identify the various varieties of fruits and vegetables and the forms in which they are available (fresh, frozen etc.).
1951.10.2 List seasons in which fresh fruits and vegetables are at their best quality and lowest price.
1951.10.3 Match different cooking methods to various fruits and vegetables.
1951.10.4 Explain how to properly select and purchase, receive, store, and handle fruits and vegetables.
1951.10.5 Prepare fruits and vegetables in a variety of ways.

Standard 11: Control food service costs. (1951.S.11)

Food Service Costs Objectives
Students will:
1951.11.1 Perform basic math operations as they relate to foodservice operations: i.e., determine percentages, convert recipes, convert form American and metric units of measure, approximate recipe yields.
1951.11.2 Describe different types of costs related to food, beverage and labor: controlled costs, fixed costs, variable costs, etc.
1951.11.3 Demonstrate operational procedures for preventing waste of food ad beverage.
1951.11.4 Show proper use of recipes, glassware, utensils, production sheets and other tools that help control waste.
1951.11.5 Determine menu prices using various methods.
1951.11.6 Illustrate the cost percentage formula and apply it to operational procedures.
1951.11.7 Describe and apply procedures used in planning and forecasting to control food, beverage and labor costs.

ProStart II

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship. This second course focuses on the basics of quality table service, menu planning, industry careers and preparing certain types of foods. It also addresses the business topics of marketing, communication, accounting, purchasing, and inventory control.

Standard 1: Prepare Potatoes, Grains and Pasta (1952.S.1)

Prepare Potatoes, Grains and Pasta Objectives
Students will:

1952.1.1 Explain how to properly select, receive, and store potatoes, grains and pasta.
1952.1.2 Match different cooking methods to potatoes, grains and pasta.
1952.1.3 Prepare potatoes, grains and pasta using a variety of recipes and cooking techniques.

Standard 2: Explain the characteristics, activities, opportunities and types of lodging operations. (1952.S.2)

Lodging Operations Objectives
Students will:

1952.2.1 Define the term "lodging property" and discuss each of the characteristic types of lodging operations.
1952.2.2 List and discuss the five key elements that differentiate one lodging establishment from another.
1952.2.3 Identify the two national organizations that rate commercial lodging establishments and list a minimum of five factors used by each in making their judgments.
1952.2.4 Identify ten services offered by some, but not all, lodging properties.
1952.2.5 Discuss career opportunities in the lodging industry and the qualifications commonly sought by lodging employers.
1952.2.6 Name the activities generally accomplished at the front desk, in housekeeping, in the front office and by engineering.
1952.2.7 Describe the different types of rates and what makes them different.

Standard 3: Demonstrate the techniques necessary for quality table service. (1952.S.3)

Table Service Objectives
Students will:

1952.3.1 Set a table properly for guests arrival.
1952.3.2 Set and clear items properly.
1952.3.3 Demonstrate different service styles: American, French, English, Russian, buffet, counter and cafeteria.
1952.3.4 Describe the traditional service staff and the duties and responsibilities of each staff position.
1952.3.5 Present a guest check, receive payment, and say good-bye to guest properly.
1952.3.6 Identify various dining utensils.
1952.3.7 Perform several tableside service and food preparation techniques.
1952.3.8 Show how servers should properly identify, describe and recommend menu items to guests.

Standard 4: Prepare desserts and baked goods. (1952.S.4)

Desserts and Baked Goods Objectives
Students will:
1952.4.1 Identify the functions of basic ingredients used in desserts and breads.
1952.4.2 Describe common desserts and methods used to prepare them.
1952.4.3 Prepare various desserts and baked goods and store them properly.
1952.4.4 Bake different types of breads and quick breads.

Standard 5: Plan an effective menu. (1952.S.5)

Menu Objectives
Students will:
1952.5.1 Characterize various menu types - a la carte, table d'hôte, California, du jour, cycle - and the operations in which they are most commonly used.
1952.5.2 Write descriptions of menus items using appetizing language.
1952.5.3 Critique the physical layout of a menu.

Standard 6: Describe how marketing techniques are used in food service. (1952.

Marketing Techniques Objectives
Students will:
1952.6.1 Describe the basic marketing concepts and terms.
1952.6.2 Describe the elements of a marketing plan.
1952.6.3 Describe elements of successful community and public relations.
1952.6.4 Write and effective press release. LA
1952.6.5 Explain the various advertising media and advantages and disadvantages of each.
1952.6.6 Plan a successful promotional campaign using commonly used professional tools.

Standard 7: Practice appropriate purchasing and inventory control procedures. (1952.S.7)

Purchasing and Inventory Control Objectives
Students will:
1952.7.1 Determine when and how often to order inventory items using both perpetual and physical inventory methods
1952.7.2 Prepare purchase specifications and purchase orders for items to be purchased.
1952.7.3 Explain the formal bidding process.
1952.7.4 Describe the factors involved in selecting appropriate suppliers.
1952.7.5 Describe proper receiving procedures.
1952.7.6 Explain procedures used to issue items and keep track of inventory.

Standard 8: Prepare meats, poultry and seafood. (1952.S.8)

Meats, Poultry and Seafood Objectives
Students will:
1952.8.1 Explain the federal grading systems for meat, poultry, fish and shellfish.
1952.8.2 Describe the various forms of meat, poultry, fish and shellfish.
1952.8.3 Discuss proper procedures for receiving, storing, and handling meat, poultry, fish and shellfish.
1952.8.4 Prepare meat, poultry, fish and shellfish using a variety of cooking methods and recipes.

Standard 9: Use Standard Accounting Practices. (1952.S.9)

Accounting Objectives

Students will:

1952.9.1 Demonstrate basic accounting principles and apply them to common foodservice scenarios.
1952.9.2 Practice double-entry accounting (recording transactions in balanced T accounts).
1952.9.3 Read and interpret income statements and balance sheets
1952.9.4 Calculate cost of sales using opening and closing inventory figures.
1952.9.5 Use the balance sheet equation to determine assets, liabilities and owners equity.

Standard 10: Prepare soups, stocks and sauces. (1952.S.10)

Soups, Stocks and Sauces Objectives

Students will:

1952.10.1 List the common ingredients of and describe the proper procedure for, making a quality stock.
1952.10.2 Prepare a stock.
1952.10.3 Describe common soups and how they are prepared.
1952.10.4 Prepare various soups.
1952.10.5 Identify the major sauce families and the sauces derived from them.
1952.10.6 Prepare quality sauces using proper procedures.

Standard 11: Describe the characteristics, components and opportunities of the tourism industry. (1952.S.11)

Tourism Objectives

Students will:

1952.11.1 Describe the role of travel and tourism in the hospitality industry.
1952.11.2 Recognize career opportunities offered in travel and tourism.
1952.11.3 Distinguish the segments that make up the travel industry.
1952.11.4 Describe the kinds of customer service skills required of people who work in the travel industry.

Standard 12: Communicate well with customers. (1952.S.12)

Communications Objectives

Students will:

1952.12.1 Display basic speaking and listening skills.
1952.12.2 Use effective writing skills in all forms of written communications.
1952.12.3 Display proper and courteous telephone skills.
1952.12.4 Describe menu items effectively and demonstrate suggestive selling techniques.

Standard 13: Complete a 400-hour, off-campus, paid internship in a food service establishment. (1952.S.13)

Internship Objectives:

Students will:

1952.13.1 Develop personal qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1952.13.2 Develop long-term work qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1952.13.3 Develop short-term observable skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.

Small Engine Fundamentals

Content Standards for this course are under development. (1961)

Small Engine Maintenance

Content Standards for this course are under development. (1963)

Small Engine Servicing and Care

Content Standards for this course are under development. (1965)

Troubleshooting Motorcycles and ATV,s I

Content Standards for this course are under development. (1967)

Troubleshooting Motorcycles and ATV,s II

Content Standards for this course are under development. (1969)

Troubleshooting Small Engine Systems

Content Standards for this course are under development. (1971)

Arc Welding

This course will give students the opportunity to advance their skills in SMAW, GMAW, FCAW, GTAW and to have the opportunity to test to a sate or national standard.

Standard 1: Perform advanced Shielded Metal Arc Welding (SMAW) processes. (1981.S.1)

Shielded Metal Arc Welding Objectives
Students will:
1981.1.1 Perform safety inspections of equipment and accessories.
1981.1.2 Make minor external repairs to equipment and accessories.
1981.1.3 Set up for shielded metal arc welding operations.
1981.1.4 Operate shielded metal arc welding equipment.
1981.1.5 Execute corrective actions to repair surface flaws on welds areas and base metals.
1981.1.6 Make fillet welds, all positions, on plain carbon steel or stainless steel plate using stainless steel electrodes.
1981.1.7 Make groove welds, all positions, on plain carbon steel or stainless steel using stainless steel electrodes.
1981.1.8 Make groove welds, all positions, according to AWS D1.1 Code.
1981.1.9 Make fillet welds, all positions, on carbon steel pipe.
1981.1.10 Prepare test coupons according to AWS D1.1 Code.

Standard 2: Apply advanced Gas Metal Arc Welding (GMAW) procedures. (1981.S.2)

Gas Metal Arc Welding Objectives
Students will:
1981.2.1 Perform safety inspections of equipment and accessories.
1981.2.2 Make minor external repairs to equipment and accessories.
1981.2.3 Set up for gas metal arc welding operations on carbon steel.
1981.2.4 Operate gas metal arc welding equipment.

Standard 3: Perform Spray Transfer processes. (1981.S.3)

Spray Transfer Objectives
Students will:
1981.3.1 Make fillet welds, all positions, on aluminum plate.
1981.3.2 Make groove welds, all positions, on aluminum plate.

Standard 4: Utilize Short Circuiting Transfer process. (1981.S.3)

Short Circuiting Transfer Objectives
Students will:
1981.4.1 Make fillet welds, all positions, on carbon steel pipe, using short circuiting transfer.
1981.4.2 Make groove welds, all positions, using short circuiting transfer to the AWS D1.1 Code.
1981.4.3 Prepare test coupons according to AWS D1.1 Code.

Standard 5: Utilize Flux Cored Arc Welding (FCAW-S, FCAW-G) processes. (1981.S.5)

Flux Cored Arc Welding Objectives
Students will:
1981.5.1 Perform safety inspections of equipment and accessories.
1981.5.2 Make minor external repairs to equipment and accessories.
1981.5.3 Set up for flux cored arc welding operations on carbon steel.

1981.5.4 Operate flux cored arc welding equipment.
1981.5.5 Make fillet welds, all positions, on carbon steel pipe, using gas-shielded electrodes.
1981.5.6 Make groove welds, all positions, according to the AWS D1.1 Code.
1981.5.7 Prepare test coupons according to AWS D1.1 Code.

Standard 6: Perform Gas Tungsten Arc Welding (GTAW). (1981.S.6)

Gas Tungsten Arc Welding Objectives
Students will:
1981.6.1 Perform safety inspections of equipment and accessories.
1981.6.2 Make minor external repairs to equipment and accessories.
1981.6.3 Set up for gas tungsten arc welding operations on carbon steel, aluminum, and stainless steel.
1981.6.4 Operate gas tungsten arc welding equipment.
1981.6.5 Make fillet welds, all positions, on aluminum.
1981.6.6 Make groove welds, all positions, on aluminum.
1981.6.7 Make fillet welds, all positions, on stainless steel.
1981.6.8 Make groove welds, all positions, on stainless steel.

Blueprint Reading and Metallurgy

This course will introduce students to the basic fundamentals of blueprint reading as it relates to the welding industry, and to the science and technology of extracting metals from their ores, refining them, and preparing them for use.

Standard 1: Determine processing requirements from drawings. (1983.S.1)

Drawings Objectives
Students will:
1983.1.1 Identify the types of lines used on blueprints.
1983.1.2 Describe various methods of dimensioning a welding blueprint.
1983.1.3 Differentiate between notes and specifications.
1983.1.4 Analyze processing requirements from information block.
1983.1.5 Explain what tolerances are, and why they are used on blueprints.
1983.1.6 Read a drawing and write a bill of materials.

Standard 2: Draw shop and field sketches. (1983.S.2)

Shop and Field Sketches Objective
Students will:
1983.2.1 Draw shop or field sketches of sample dimensions, notes, and specifications.

Standard 3: Identify and interpret basic welding symbols. (1983.S.3)

Welding Symbols Objectives
Students will:
1983.3.1 Differentiate common types of welds and joints.
1983.3.2 Identify weld symbols and draw samples of each.
1983.3.3 Match parts of a fillet weld and a groove weld with their geometric definitions.
1983.3.4 Draw fillet and groove weld symbols with different requirements.
1983.3.5 Interpret common abbreviations for blueprints and welding processes.

Standard 4: Understand the composition of metals, their atomic structures and properties, and how they behave when exposed to different conditions of use. (1983.S.4)

Metals Objectives
Students will:
1983.4.1 Define metallurgy and describe historical developments.
1983.4.2 Define terms related to metallurgy.
1983.4.3 Distinguish between mechanical and physical properties.
1983.4.4 Compare chemical characteristics of ferrous and non-ferrous metals.
1983.4.5 Describe in writing, various heat treating processes.
1983.4.6 Explain welding characteristics of low, medium, and high carbon steel, alloy steels, cast iron, stainless and high chromium steels, Austenitic manganese steels, tool and die steels, and exotic steels.

Fundamentals of Welding Technology

This course will introduce students to the basic fundamentals of welding/cutting. Students will become familiar with general safety, welding terms and joints, and oxyfuel welding techniques.

Standard 1: Identify, explore, and evaluate career opportunities related to welding. (1985.S.1)

Career Opportunities Objectives
Students will:
1985.1.1 Describe a variety of careers related to welding, and the training necessary to be successful in those careers.
1985.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of welding.
1985.1.3 Identify sources of information about careers in welding.

Standard 2: Identify and practice safety during tool and equipment use and practice safe conduct in welding shop. (1985.S.2)

Welding Shop Objectives
Students will:
1985.2.1 Recognize and follow general welding shop safety guidelines.
1985.2.2 Discuss the precautions needed to avoid fires in the welding area.
1985.2.3 Describe how a closed container can be welded.
1985.2.4 Describe the precautions to be taken when welding in confined areas.
1985.2.5 Explain the purpose of tinted lenses used during welding and cutting.
1985.2.6 Describe the protective clothing, eye, face and head gear worn by welder.
1985.2.7 Recognize what fumes, gases, dust and smoke must be removed.
1985.2.8 List and describe electrical safety when using ARC welding equipment.
1985.2.9 Illustrate safe handling and storage of compressed gas cylinders and explain safety involved with use of acetylene gas.

Standard 3: Express knowledge of the basic terms and processes associated with the welding industry. (1985.S.3)

Welding Industry Objectives
Students will:
1985.3.1 Tell what the American Welding Association does for welders.
1985.3.2 Define welding and explain coalescence and filler material.
1985.3.3 State the difference between fusion welding, brazing, soldering and solid-state welding.
1985.3.4 List the major welding fusion welding processes and state the differences between them.
1985.3.5 Discuss the purpose and functions of SMAW electrodes.

Standard 4: Setup oxyfuel welding and cutting equipment and demonstrate the safe use of the equipment. (1985.S.4)

Oxyfuel Welding and Cutting Equipment Objectives
Students will:
1985.4.1 Obtain oxyfuel cylinders, chain into work station, assemble and set up oxy fuel stationary and mobile cutting equipment.
1985.4.2 Perform soap and water leak test and set line pressure according to the tip size and metal thickness.
1985.4.3 Lay out pattern on metal using steel rule, square and soapstone.
1985.4.4 Make 90 degree straight cuts, bevel cuts and hole cuts.

1985.4.5 List five (5) reasons for poor cuts and four (4) causes for back fire.

1985.4.6 Clean and maintain cutting equipment and demonstrate proper shut down and storage of the equipment.

1985.4.7 Choose the proper tip size for braze welding and oxyacetylene welding, light and adjust flame for proper welding of mild steel.

Gas Metal Arc Welding

This course will introduce students to basic skills in gas metal arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Gas Metal Arc welding equipment. (1987.S.1)

Gas Metal Arc Objectives
Students will:
1987.1.1 Perform safety inspections of equipment and accessories.
1987.1.2 Make minor external repairs to equipment and accessories.
1987.1.3 Set up for gas metal arc welding operations on plain carbon steel.
1987.1.4 Operate gas metal arc welding equipment.

Standard 2: Perform GMAW using short circuit transfer. (1987.S.2)

Short Circuit Transfer Objectives
Students will:
1987.2.1 Make fillet welds, all positions, on plain carbon steel.
1987.2.2 Make groove welds, all positions, on plain carbon steel.

Standard 3: Perform GMAW using Sray transfer. (1987.S.3)

Sray Transfer Objectives
Students will:
1987.3.1 Make 1F-2F welds on plain carbon steel.
1987.3.2 Make 1G welds on plain carbon steel.

Standard 4: Set up and use Flux Cored Arc welding equipment (FCAW, FCAW-G). (1987.S.4)

Flux Cored Arc Objectives
Students will:
1987.4.1 Perform safety inspections of equipment and accessories.
1987.4.2 Make minor external repairs to equipment and accessories.
1987.4.3 Set up for flux cored arc welding operations on plain carbon steel.
1987.4.4 Operate flux cored arc welding equipment.
1987.4.5 Make fillet welds, all positions, on plain carbon steel.
1987.4.6 Make groove welds, all positions, on plain carbon steel.

Gas Tungsten Arc Welding

This course will introduce students to basic skills in gas tungsten arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Gas Tungsten Arc welding equipment. (1989.S.1)

Gas Tungsten Arc Welding Objectives

The student will

1989.1.1 Perform safety inspections of equipment and accessories.
1989.1.2 Make minor external repairs to equipment and accessories.
1989.1.3 Set up for gas tungsten arc welding operations on plain carbon steel, aluminum, and stainless steel.
1989.1.4 Operate gas tungsten arc welding equipment.
1989.1.5 Make fillet welds, all positions, on plain carbon steel.
1989.1.6 Make groove welds all positions, on plain carbon steel.
1989.1.7 Make 1F-2F welds on aluminum.
1989.1.8 Make 1G welds on aluminum.
1989.1.9 Make 1F-3F welds on stainless steel.
1989.1.10 Make 1G-2G welds on stainless steel.

Shielded Metal Arc Welding

This course will introduce students to basic skills in shielded metal arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Shielded Metal Arc welding equipment in all positions. (1993.S.1)

Shielded Metal Arc Objectives

Students will:

1993.1.1 Perform safety inspections of equipment and accessories.
1993.1.2 Make minor external repairs to equipment and accessories.
1993.1.3 Setup for SMAW operations on plain carbon steel.
1993.1.4 Operate SMAW equipment.
1993.1.5 Make fillet welds in all positions on plain carbon steel.
1993.1.6 Make groove welds in all positions on carbon steel.
1993.1.7 Perform horizontal and vertical limited thickness qualification test on carbon steel plate.
1993.1.8 Interpret test results.
1993.1.9 Discuss electrode handling procedures.
1993.1.10 Finish metal surfaces with hand and power tools.

Thermal Cutting and Welding

This course will introduce students to the basic fundamentals to effectively use the oxyfuel welding and cutting processes to produce welded and brazed joints, and to cut straight lines and shapes.

Standard 1: Set up oxyfuel cutting equipment and demonstrate it's safe use. (1995.S.1)

Oxyfuel Cutting Equipment Objectives
Students will:
1995.1.1 Describe historical developments in thermal cutting and welding.
1995.1.2 Recognize safety related to thermal cutting.

Standard 2: Perform manual oxyfuel gas cutting and demonstrate it's safe use. (1995.S.2)

Manual Oxyfuel Gas Cutting Objectives
Students will:
1995.2.1 Perform safety inspections of equipment and accessories.
1995.2.2 Make minor repairs to equipment and accessories.
1995.2.3 Set up for manual oxyfuel gas cutting operations.
1995.2.4 Perform oxyfuel gas cutting, beveling, and piercing operations.
1995.2.5 Perform arc cutting, beveling, and piercing operations.
1995.2.6 Perform shape cutting and bevel cutting operations on plain carbon steel.
1995.2.7 Remove weld metal from plain carbon steel by using weld washing technique.

Standard 3: Perform oxyfuel welding and brazing and demonstrate it's safe use. (1995.S.3)

Oxyfuel Welding and Brazing Objectives
Students will:
1995.3.1 Perform safety inspections of equipment and accessories.
1995.3.2 Set and weld mild steel using oxyfuel welding equipment.
1995.3.3 Set and braze mild steel using oxyfuel welding equipment.

Standard 4: Perform machine oxyfuel gas cutting (OFC) and demonstrate it's safe use. (1995.S.4)

Machine Oxyfuel Gas Cutting Objectives
Students will:
1995.4.1 Perform safety inspections of equipment and accessories.
1995.4.2 Make minor external repairs to equipment and accessories.
1995.4.3 Set up for manual air carbon arc gouging and cutting operations on plain carbon steel.
1995.4.4 Operate manual air carbon arc cutting equipment.
1995.4.5 Perform metal removal operations on plain carbon steel.

Standard 5: Set up and safe use of plasma arc cutting (PAC) equipment. (1995.S.5)

Plasma Arc Cutting Objectives
Students will:
1995.5.1 Perform safety inspections on equipment and accessories.
1995.5.2 Make minor external repairs to equipment and accessories.
1995.5.3 Set up for manual plasma arc cutting operations on plain carbon steel, aluminum, and stainless steel.
1995.5.4 Operate manual plasma arc cutting equipment.
1995.5.5 Perform shape cutting operations on plain carbon steel, aluminum, and stainless steel.

Exploring Technology (2401-2409 inclusive)

Exploring technology is a comprehensive, action based educational program for middle school concerned with the ways that humans use communication, manufacturing, transportation and construction to adapt to their environment. It is necessary for all people to understand technology if they are to function as informed voters, productive workers and wise consumers of technological products. Content and activities involve students' use of tools, materials and processes.

Standard 1: Systems Model (2401.S.1)
Students will understand the concept of a systems model and how it applies to technology.

Systems Model Objectives
Students will:
2401.1.1 Define technology and its four major systems: communication, transportation, construction and manufacturing.
2401.1.2 Name the parts of a technological system, and describe each of the four systems using this model.

Standard 2: Technical Developments (2401.S.1)
Students will recognize the evolving nature of technology and describe its potential for impacting the future.

Technical Developments Objectives
Students will:
2401.2.1 Identify and describe important historical developments in the evolution of technology.
2401.2.2 Use past and present technological developments to predict trends and possible future developments.

Standard 3: Academic Applications (2401.S.3)
Students will integrate academic skills with technological knowledge when solving problems.

Academic Applications Objectives
Students will:
2401.3.1 Solve math and measurement problems as they relate to specific technological systems.
2401.3.2 Apply vocabulary and reading comprehension skills to the study of technology.
2401.3.3 Develop and organize a presentation to inform by using: written, graphic, and verbal techniques.
2401.3.4 Apply concepts of science to real world technological problems.
2401.3.5 Demonstrate the use of critical thinking skills when analyzing technological solutions.
2401.3.6 Use computer hardware and software where applicable in the study of technology.

Standard 4: Problem Solving (2401.S.4)
Students will develop and demonstrate technological problem solving skills and processes when developing solutions to problems.

Problem Solving Objectives
Students will:
2401.4.1 Generate ideas and design solutions to problems through sketches, drawings and notes.
2401.4.2 Plan and select the materials, energy, tools and processes needed and produce a physical model or prototype of the solution.
2401.4.3 Test the solution.
2401.4.4 Analyze test results and evaluate the success of the solution.

Standard 5: Resources (2401.S.5)
Students will solve problems and make decisions involving resources to create and improve technological systems.

Resources Objectives
Students will:
2401.5.1 Define the term "resource", and list resources in a given technological system.
2401.5.2 Use and reuse a variety of resources in an efficient manner.
2401.5.3 Demonstrate proper use and care of tools and equipment.
2401.5.4 Identify and practice all given safety rules when using materials and equipment in laboratory and classroom activities.
2401.5.5 Use tools, machines and equipment at an appropriate skill level to separate materials; change the shape of materials; join materials; and process information.

Standard 6: Communication Systems (2401.S.6)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of communication systems.

Communication Systems Objectives
Students will:
2401.6.1 Demonstrate proper layout and design principles when designing messages.
2401.6.2 Identify and properly construct the three principle views of an object using sketching and/or drafting tools and techniques.
2401.6.3 Compare and contrast each of the major printing methods used in industry and use at least two methods to make prints which convey a message.
2401.6.4 Explain the basic electrical concepts necessary to operate a simple circuit, and simulate one communication device by constructing a working model.
2401.6.5 Describe major telecommunication devices, and experiment with at least one device in an activity.

Standard 7: Construction Systems (2401.S.7)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of construction systems.

Construction Systems Objectives
Students will:
2401.7.1 Identify a variety of different types of structures, and explain the various uses made of them.
2401.7.2 Explain how loads and forces affect a structural system.
2401.7.3 Identify basic structural elements and techniques used in light construction, and use at least three in classroom activities.
2401.7.4 Identify basic structural elements and techniques used in heavy construction, and use at least one in a classroom activity.
2401.7.5 Compare and contrast the characteristics of a variety of construction materials in relation to their intended purpose.
2401.7.6 Explain the importance of blueprints, specifications, and scheduling of labor and materials to the management of a construction project.

Standard 8: Manufacturing Systems (2401.S.8)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of manufacturing systems.

Manufacturing Systems Objectives
Students will:
2401.8.1 Describe methods used to acquire a variety of raw material resources, including woods, metals, plastics and ceramics.

2401.8.2 Explain the importance of standard stock, and the various methods that industry uses to convert raw materials into standard stock.
2401.8.3 Compare and contrast the various forming operations (casting/molding, compressing/ stretching, and conditioning) and perform at least one operation in each category.
2401.8.4 Compare and contrast the various separating operations (shearing, chip removal, other) and perform at least one operation in each category.
2401.8.5 Compare and contrast the various combining operations (mechanical fastening, adhesive bonding, cohesive bonding coating, and mixing) and perform at least one operation in each category.
2401.8.6 Describe the five organizational departments of a manufacturing company.
2401.8.7 Participate in the establishment and production of a product in student-organized company.

Standard 9: Transportation Systems (2401.S.9)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of transportation systems.

Transportation Systems Objectives
Students will:
2401.9.1 Identify and describe the four environments in which vehicles operate.
2401.9.2 Classify transportation devices according to four operating environments.
2401.9.3 Determine the advantages and disadvantages of a variety of modes of transportation according to their purpose.
2401.9.4 Define the six technical sub-systems of a transportation device.
2401.9.5 Explore a variety of modes of transportation by designing, producing, operating and analyzing the efficiency of at least two models.

Standard 10: Leadership (2401.S.10)
Students will function as a leader, follower, organizer and planner.

Leadership Objectives
Students will:
2401.10.1 Demonstrate the value of working independently and cooperatively in activities.
2401.10.2 Develop civic pride and responsibility by participating in service activities to benefit others.
2401.10.3 Experience leadership development through participation in Technology Student Association activities.

Standard 11: Impacts (2401.S.11)
Students will identify societal problems and environmental impacts that result from the use of technological products and processes.

Impacts Objectives
Students will:
2401.11.1 List several social changes brought about by developments in technology.
2401.11.2 Describe the positive and negative implications that various technologies have had on the environment.
2401.11.3 Explain the impact of renewable and non-renewable resources on the individual, society and the environment.

Standard 12: Careers (2401.S.12)
Students will identify and explore major career opportunities in the engineering and technical field.

Careers Objectives

Students will:

2401.12.1 Use available resources to research a variety of careers associated with engineering and technical fields.

2401.12.2 Evaluate a variety of engineering and technical careers as they relate to personal interests and aptitudes.

Communication Systems

This course will introduce students to a variety of ways that people use tools and resources to communicate. Topics include the processes of communication, the sources of energy used to communicate, and the technological advancements that are rapidly affecting the world. Students will explore various applications in communication technology through hands-on activities.

Standard 1: Background (2421.S.1)
Students will describe the communication system, its development and importance in the world today.

Background Objectives
Students will:
2421.1.1 Define communication technology, listing the inputs, processes, outputs and feedback and give examples of each.
2421.1.2 Identify and describe important inventions and developments in communication technology.
2421.1.3 Examine the advantages and disadvantages of a variety of graphic and electronic communication methods as to their efficiency (economics, speed, effectiveness).

Standard 2: Communication Applications (2421.S.2)
Students will use oral and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2421.2.1 Use a variety of techniques to access information and use the information to solve design problems in communication.
2421.2.2 Write a technical report explaining a specific communication process, which reflects appropriate technical style, and use word processing software to generate the report.
2421.2.3 Prepare and deliver a 3-5 minute speech on a given topic in communication.
2421.2.4 Apply vocabulary and reading comprehension skills used in communication occupations.
2421.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2421.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to communication careers.

Mathematical Applications Objectives
Students will:
2421.3.1 Perform mathematical computations as they relate to communication activities (page layout, circuitry problems, etc.)
2421.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2421.S.4)
Students will apply the basic steps in the problem solving process to develop solutions to a variety of communication problems.

Problem Solving Objectives
Students will:
2421.4.1 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2421.4.2 Plan and select materials, energy, tools and processes needed for producing solutions to a variety of problems, and use them to solve a variety of problems.
2421.4.3 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.

2421.4.4 Interpret the information gained, and evaluate the success of solutions.

Standard 5: Safety (2421.S.5)
Students will develop appropriate health and safety practices associated with the communication system.

Safety Objectives
Students will:
2421.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the communication laboratory.
2421.5.2 Describe safety measures and industrial laws and regulations used by communication industries to protect workers on the job.

Standard 6: Mechanical Drawing (2421.S.6)
Students will effectively use mechanical drawing and CAD to communicate graphically.

Mechanical Drawing Objectives
Students will:
2421.6.1 Correctly use a variety of drafting tools to create drawings.
2421.6.2 Use an introductory CAD program to produce a simple drawing, demonstrating basic functions of CAD.
2421.6.3 Correctly draw the necessary views for given orthographic drawings.
2421.6.4 Correctly draw an isometric drawing of a given object and use it in the design of a message.

Standard 7: Layout and Design (2421.S.7)
Students will design and create a variety of graphic messages using proper techniques.

Layout and Design Objectives
Students will:
2421.7.1 Describe the elements and principles of design (color, shape, line, texture, proportion, balance, rhythm, and unity) and apply them when designing a poster.
2421.7.2 Demonstrate proper techniques for producing a thumbnail, rough layout and comprehensive mechanical layout.
2421.7.3 Use desktop publishing software to create a one-page flyer advertising a given item.
2421.7.4 Describe common methods of creating a printed image, and compare various reproduction methods.

Standard 8: Graphic Arts (2421.S.8)
Students will define the general steps necessary to produce a printed product (image design, generation and assembly, carrier preparation, transfer, and product finishing).

Graphic Arts Objectives
Students will:
2421.8.1 Compare and contrast a variety of techniques used to duplicate messages.
2421.8.2 Choose the appropriate method and reproduce a selected project, explaining the reason for your choice of printing method.

Standard 9: Telecommunication (2421.S.9)
Students will examine the processes used in electronic communication and their applications.

Telecommunication Objectives
Students will:
2421.9.1 Explain the basic principles of electricity as they relate to the operation of various communication devices.
2421.9.2 Explain the principle of electromagnetism as it relates to communication and construct a device

that operates on this principle.

2421.9.3 Identify the four basic requirements for an electrical circuit and solve a communication problem involving simple circuitry.

2421.9.4 Define the processes of encoding, transmitting, receiving, storing, retrieving, and decoding information.

2421.9.5 Utilize a commercial electronic communication device (video equipment, laser/fiber optics, computer/modem) to design, send, and receive a message, describing the six processes involved.

Standard 10: Impacts (2421.S.10)

Students will examine the impacts and future implications of communication systems as they relate to society, the economy, and the environment.

Impacts Objectives

Students will:

2421.10.1 Discuss several social changes brought about by technological developments in the communication industry.

2421.10.2 Explain how our economy is affected by developments in communication systems and give examples.

2421.10.3 Describe positive and negative implications that various communication technologies have had on the environment.

2421.10.4 Discuss a variety of future developments in communication and their possible effects on society, the economy and the environment.

Construction Systems

This course will introduce students to the principles of the construction industry. Topics range from how construction meets the needs of society to basic construction techniques. Students will explore various applications in construction technology through hands on activities.

Standard 1: Background (2424.S.1)
Students will describe the construction system, its development and importance in the world today.

Background Objectives
Students will:
2424.1.1 Define construction technology, listing the inputs, processes, outputs and feedback and give examples of each.
2424.1.2 Compare and contrast various types of structures and uses made of them.
2424.1.3 Identify and describe important inventions and developments in construction technology.

Standard 2: Communications Applications (2424.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2424.2.1 Use a variety of techniques to access information and use the information to solve design problems in construction.
2424.2.2 write a technical report explaining a specific construction process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2424.2.3 Prepare and deliver a 3-5 minute speech on a given topic in construction.
2424.2.4 Apply vocabulary and reading comprehension skills used in construction occupations.

Standard 3: Mathematical Applications (2424.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to construction careers.

Mathematical Applications Objectives
Students will:
2424.3.1 Perform mathematical computations as they relate to construction activities (calculating square feet, foundation layouts, triangulation, etc.).
2424.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2424.S.4)
Students will apply the basic steps in the problem solving process to develop solutions to a variety of construction problems.

Problem Solving Objectives
Students will:
2424.4.1 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2424.4.2 Plan and select materials, energy, tools and processes needed for producing solutions to a variety of problems, and use them to solve a variety of problems.
2424.4.3 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.
2424.4.4 Interpret the information gained, and evaluate the success of solutions.

Standard 5: Safety (2424.S.5)
Students will develop appropriate health and safety practices associated with the construction system.

Safety Objectives
Students will:
2424.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the construction laboratory.
2424.5.2 Describe safety measures and industrial laws and regulations used by construction industries to protect workers on the job.

Standard 6: Resources (2424.S.6)
Students will identify, evaluate, and select common tools, materials, energy, and information to design, engineer, and produce structures.

Resources Objectives
Students will:
2424.6.1 Describe a variety of construction materials, and conduct tests on common structural materials to determine their physical characteristics.
2424.6.2 Perform various forming, separating, and combining processes on construction materials.

Standard 7: Forces and Loads (2424.S.7)
Students will identify and examine the forces and loads acting upon structural elements.

Forces and Loads Objectives
Students will:
2424.7.1 differentiate between the forces that act on structures (tension, compression, shear, and torsion), and determine which forces are present in various structural elements.
2424.7.2 Differentiate between static, continuous dynamic, and impact dynamic loads, and give examples of each.
2424.7.3 Calculate load stress in a structure and give the answer in load per square inch or load per square foot.

Standard 8: Producing Structures (2424.S.8)
Students will understand the processes used to design, engineer, and produce a variety of types of structures.

Producing Structures Objectives
Students will:
2424.8.1 Differentiate between light and heavy construction by identifying structures, structural elements, and building techniques used in each type of construction.
2424.8.2 Identify several points which must be considered when evaluating a potential construction site, and identify an acceptable location for a structure, given a properly prepared plot plan.
2424.8.3 Design a living space, identifying basic and non-basic activity areas; plan traffic flow pattern and efficient room layout.
2424.8.4 Given a cross sectional view of a foundation and framed superstructure, explain the purpose of each, and identify several structural parts.
2424.8.5 Explain the basic steps of enclosing a structure.
2424.8.6 Describe the importance of insulating a structure and identify the five paths of heating/ cooling loss in a home.
2424.8.7 Identify internal and external utility systems.
2424.8.8 Describe several internal and external finishing processes.
2424.8.9 Describe a variety of heavy construction projects (dams, highways, bridges, and pipelines) and their relationship to the transportation industry.

2424.8.10 Participate in the various steps, from planning to finished construction, of a model scale structure.

Standard 9: Managing Construction Projects (2424.S.9)
Students will understand the processes related to managing a construction project.

Managing Construction Projects Objectives
Students will:
2424.9.1 Define and describe the three activities of management (planning, organizing, and controlling).
2424.9.2 Describe how a contractor organizes a construction project, including the concept of subcontracting, controlling construction costs, and scheduling of required inspections.

Standard 10: Impacts (2424.S.10)
Students will understand the impacts and future implications of construction systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:
2424.10.1 Discuss several social changes brought about by technological developments in the construction industry.
2424.10.2 Explain how our economy is affected by developments in construction systems and give examples.
2424.10.3 Describe positive and negative implications that various construction technologies have had on the environment.
2424.10.4 Discuss a variety of future developments in construction and their possible effects on society, the economy and the environment.

Foundations In Engineering

This course will introduce students to the basic principles of materials, mechanisms, structures, electricity, electronic control, fluidics, and graphic communication and how they can be integrated and used to solve a variety of complex technical challenges. Students work in engineering teams to develop work process skills, such as researching, writing, organizing, modeling, calculating, and communicating with others.

Standard 1: Problem Solving (2436.S.1)
Students will understand the basic steps in the problem solving process to develop solutions to a variety of technological problems.

Problem Solving Objectives
Students will:
2436.1.1 Identify and describe the four basic steps in the problem solving process.
2436.1.2 Explain at least four factors that influence the design process.

Standard 2: Conducting Research (2436.S.2)
Students will understand how to generate ideas and use a variety of information gathering techniques to conduct research and gather data.

Conducting Research Objectives
Students will:
2436.2.1 Use a variety of divergent and convergent methods (mind mapping, brainstorming, consensus) to generate ideas, organize thoughts, and represent relationships between concepts.
2436.2.2 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2436.2.3 Discuss the purpose and importance of research in the design process.
2436.2.4 Apply vocabulary and reading comprehension skills used in engineering.
2436.2.5 Effectively use a variety of information gathering techniques to compile research information for designs.
2436.2.6 Properly document information gained from any resource.
2436.2.7 Develop and use a questionnaire or interview guide designed to gain specific information from people, then use spreadsheet software to design a chart or graph to display the data gathered.
2436.2.8 Conduct destructive and nondestructive tests on a variety of materials to determine their characteristics, collect data and produce a computer graph to display information about a material's properties.
2436.2.9 Determine which specific materials are most appropriate for a given product, and justify your answer.

Standard 3: Documenting Design Work (2436.S.3)
Students will understand the importance of documenting design work and use a variety of methods to record design ideas.

Design Work Objectives
Students will:
2436.3.1 Describe various methods to document design work.
2436.3.2 Provide three good reasons for documenting design work.
2436.3.3 Create a design portfolio, using a variety of methods to document your design work.
2436.3.4 Use desktop publishing software to create a variety of titles, graphics and layouts for your portfolio.
2436.3.5 Properly sketch and dimension a variety of drawings using orthographic projection and pictorial drawing techniques.

2436.3.6 Create technical sketches that depict various details of a product.
2436.3.7 Use computer assisted drafting to communicate graphic solutions to a variety of problems.

Standard 4: Factors Affecting Design (2436.S.4)
Students will consider the various factors that affect design when creating solutions to problems. Demonstrate how to gather anthropometrics data, and apply it to the design of products.

Factors Affecting Design Objectives
Students will:
2436.4.1 Specify the functional criteria of a variety of consumer products.
2436.4.2 Effectively apply the elements and principles of design when creating solutions to problems.
2436.4.3 Describe the internal and external forces that are exerted on a structure, and explain why they need to be considered in the design of an object.
2436.4.4 Compare and contrast various structural elements and apply them to the solution of design problems.

Standard 5: Technological Resources (2436.S.5)
Students will understand and integrate a variety of technological resources to produce models to design problems.

Technological Resources Objectives
Students will:
2436.5.1 Define and describe the difference between appearance models, working models, prototypes, and computer models.
2436.5.2 Plan and select appropriate materials needed for producing solutions to a variety of problems.
2436.5.3 Identify a variety of tools and equipment and methods used to control them.
2436.5.4 Describe general safety rules and demonstrate safe use of any tool or piece of equipment that may be used in the engineering/ technical laboratory.
2436.5.5 Perform various forming, separating, and combining processes when creating models for design solutions.
2436.5.6 Demonstrate how various mechanisms, including gear trains, pulleys, cams, cranks, links and levers affect changing types of movement.
2436.5.7 Describe and apply the concept of mechanical advantage, velocity ratio, and efficiency.
2436.5.8 Explain the relationship between current, voltage, and resistance, and use appropriate meters to measure each.
2436.5.9 Describe the operation of and properly use a variety of switches, diodes, variable resistors, and fuses to create circuits to solve design problems.
2436.5.10 Correctly draw a diagram of a circuit and build the circuit from the diagram.
2436.5.11 Describe the purpose of and use various sensing devices (switches, temperature and light sensors) and actuator devices (buzzers, lamps) and use them in control circuits.
2436.5.12 Explain the nature of digital signals in electronic circuits and represent them in binary arithmetical form.
2436.5.13 Apply common digital processing blocks used in electronic circuits such as AND and OR gates in the solution of problems.
2436.5.14 Explain the concept of 3 port and 5 port valves, and single and double acting cylinders, and use them to control design solutions.
2436.5.15 Explain the concept of controlling the speed of cylinders and use a variety of controlling arrangements such as delay circuits, (reservoirs, restrictors, and/or valves) to produce delays, AND, OR and NOT functions.
2436.5.16 Describe the locus of moving points in mechanisms and explain how cylinders are mounted to provide appropriate angular travel.
2436.5.17 Demonstrate the ability to integrate the various technologies and use them to build models of working solutions.

Standard 6: Testing and Analyzing (2436.S.6)
Students will understand the importance of testing and analyzing a design solution and use the information for improvement.

Testing and Analyzing Objectives
Students will:
2436.6.1 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.
2436.6.2 Interpret the information gained by calculating the efficiency of a given design.
2436.6.3 Analyze test results and use them to suggest redesign strategies.

Standard 7: Presenting Information (2436.S.7)
Students will demonstrate a variety of methods to present information.

Presenting Information Objectives
Students will:
2436.7.1 Write objective reports reflecting appropriate technical style, and use word processing software to generate the report.
2436.7.2 Prepare and deliver a 3-5 minute speech on a given topic.
2436.7.3 Design and create an effective physical display to explain the solution to a specific design problem.
2436.7.4 Design and create a variety of publications and displays by hand and with desktop publishing software.
2436.7.5 Prepare and deliver a 3-5 minute multimedia presentation on a given topic.

Standard 8: Leadership (2436.S.8)
Students will develop personal responsibility and leadership skills through participation in engineering team activities.

Leadership Objectives
Students will:
2436.8.1 Share responsibility of the problem solving process in a group.
2436.8.2 Demonstrate the value of working independently and cooperatively in activities.

Standard 9: Careers (2436.S.9)
Students will explore a variety of careers that are involved in the engineering field, and the skills, qualifications and requirements necessary to work in this field.

Careers Objectives
Students will:
2436.9.1 Define at least five types of engineers, and give examples of how they use the design process in their specific jobs.
2436.9.2 Discuss a variety of businesses and industries that use design engineers, and what type of work each does.
2436.9.3 Examine the skills and training necessary to be successful in an engineering career.

Manufacturing Systems

This course will introduce students to the basic elements of the manufacturing industry. Students will explore a variety of materials and processing techniques common to manufacturing, and apply this knowledge to the development and operation of a student manufacturing enterprise.

Standard 1: Background (2442.S.1)
Students will describe the manufacturing system, its development and importance in the world today.

Objectives
Students will:
2442.1.1 Define manufacturing technology, listing the inputs, processes, outputs and feedback and give examples of each.
2442.1.2 Describe the stages of manufacturing, from securing raw materials to distributing the finished product.
2442.1.3 Identify and describe important inventions and developments in manufacturing technology.

Standard 2: Communication Applications (2442.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2442.2.1 Use a variety of techniques to access information and use it to solve design problems in manufacturing.
2442.2.2 Write a technical report explaining a specific manufacturing process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2442.2.3 Prepare and deliver a 3-5 minute speech on a given topic in manufacturing.
2442.2.4 Apply vocabulary and reading comprehension skills used in manufacturing occupations.
2442.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2442.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to manufacturing careers.

Mathematical Applications Objectives
Students will:
2442.3.1 Perform mathematical computations as they relate to manufacturing activities (calculating break even points, board feet, bills of materials, etc.).
2442.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Management (2442.S.4)
Students will discuss and apply standard forms of management, which are used in the manufacturing industry.

Management Objectives
Students will:
2442.4.1 Develop a management team to run a simulated company, using it to improve quality, productivity, and economic competitiveness in manufacturing.

Standard 5: Research and Development (2442.S.5)
Students will understand processes used to conduct research and develop products by a manufacturing enterprise.

Research and Development Objectives
Students will:
2442.5.1 Practice a variety of ways to generate ideas to solve problems.
2442.5.2 Conduct a market survey to determine the potential sales of a product you have designed.
2442.5.3 Design and construct a working model of a potential product.
2442.5.4 Use testing strategies to evaluate the model, and analyze the information gained through testing to evaluate the success of the product.

Standard 6: Finances and Accounting (2442.S.6)
Students will apply processes used to manage finances in a manufacturing industry.

Finances and Accounting Objectives
Students will:
2442.6.1 Estimate fixed and variable manufacturing costs.
2442.6.2 Prepare a master budget and maintain a general ledger.

Standard 7: Safety (2442.S.7)
Students will develop appropriate health and safety practices associated with the manufacturing system.

Safety Objectives
Students will:
2442.7.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the manufacturing laboratory.
2442.7.2 Describe safety measures and industrial laws and regulations used by manufacturing industries to protect workers on the job.

Standard 8: Industrial Relations (2442.S.8)
Students will identify processes used to promote good industrial relations.

Industrial Relations Objectives
Students will:
2442.8.1 Describe the three (3) major types of industrial relations (employee, labor, public) and list several functions of each.

Standard 9: Resources (2442.S.9)
Students will identify and select common materials, tools, and equipment and use them to design and produce products.

Resources Objectives
Students will:
2442.9.1 Identify common materials (metallic, ceramic, natural and synthetic polymers) and describe their characteristic properties.
2442.9.2 Identify various types of tools and equipment and the methods used to safely control them.
2442.9.3 Form and/or separate standard stock into one piece products or components of multiple piece products.
2442.9.4 Combine components into subassemblies and final products.

Standard 10: Producing Products
Students will demonstrate and understand processes used to plan for and produce high quality products.

Producing Products Objectives
Students will:

2442.10.1 Describe the five major activities that occur in the manufacturing area (planning, control, plant engineering, quality control, and material processing).

2442.10.2 Describe the similarities and differences of custom, intermittent, and continuous flow techniques.

2442.10.3 Develop an operation flow chart.

2442.10.4 Develop a flow process chart (operations, delays, etc.) for a product.

2442.10.5 Construct jigs/fixtures required for a manufacturing run.

2442.10.6 Apply intermittent (job lot) production techniques to prepare standard stock for a continuous flow production, using appropriate jigs and fixtures.

2442.10.7 Apply continuous flow production techniques to produce a finished product using appropriate jigs and fixtures.

2442.10.8 Compare and contrast the prevention (SPC) and the detection (inspection) system of quality control.

Standard 11: Impacts (2442.S.11)
Students will examine the impacts and future implications of manufacturing systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:

2442.11.1 Discuss several social changes brought about by technological developments in the manufacturing industry.

2442.11.2 Explain how our economy is affected by developments in manufacturing systems and give examples.

2442.11.3 Describe positive and negative implications that various manufacturing technologies have had on the environment.

2442.11.4 Discuss a variety of future developments in manufacturing and their possible effects on society, the economy and the environment.

Mechanical Services Systems

This course will introduce students to the basic principles of mechanisms, electricity/electronics and fluidics involved in the support, maintenance, design and installation of all types of mechanical and electrical devices. Students will explore a variety of techniques used in the mechanical services industry, and apply this knowledge in a variety of hands-on activities.

Standard 1: Background (2445.S.1)
Students will describe the mechanical services system, its development and importance in the world today.

Background Objectives
Students will:
2445.1.1 Define mechanical services technology.
2445.1.2 Identify and describe important inventions and developments in the evolution of the mechanical services industry.

Standard 2: Communication Applications (2445.S.1)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2445.2.1 Use a variety of techniques to access information and use it to solve design problems in mechanical services.
2445.2.2 Write a technical report explaining a specific mechanical services process, which reflects appropriate technical style, and use word processing software to generate the report.
2445.2.3 Prepare and deliver a 3-5 minute extemporaneous speech on a given topic in mechanical services.
2445.2.4 Apply vocabulary and reading comprehension skills used in mechanical services.
2445.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2445.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to mechanical services careers.

Mathematical Applications Objectives
Students will:
2445.3.1 Continue to use English and Metric measurements accurately.
2445.3.2 Perform mathematical computations as they relate to mechanical services activities (calculating break-even points, board feet, bills of materials, etc.)
2445.3.3 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2445.S.4)
Students will apply design, creativity and critical thinking skills to develop solutions to a variety of problems to meet specific criteria.

Problem Solving Objectives
Students will:
2445.4.1 Generate ideas and design solutions to problems through sketches, drawings, and notes.
2445.4.2 Plan and select the materials, energy, tools, and processes needed for producing solutions to mechanical services problems, and produce solutions to a variety of mechanical services

problems.

2445.4.3 Test the solution to a variety of mechanical services problems, and analyze test results to valuate the success of solutions.

Standard 5: Safety (2445.S.5)
Students will develop appropriate health and safety practices associated with the mechanical services industry.

Safety Objectives
Students will:
2445.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the mechanical services field and in the training laboratory.
2445.5.2 Describe safety measures and industrial laws and regulations used by companies to protect mechanical services workers on the job.

Standard 6: Electricity and Electronics (2445.S.6)
Students will explain the basic principles of electricity and electronics as they relate to the various operations involved in mechanical services.

Electricity and Electronics Objectives
Students will:
2445.6.1 Identify the basic requirements for an electrical circuit and solve problems involving simple circuitry.
2445.6.2 Explain the principle of electro-magnetism and describe devices that operate on this principle.
2445.6.3 Identify and explain electric control of pneumatic and hydraulic systems (single and multiple gas and fluid systems).

Standard 7: Fluidics (2445.S.7)
Students will explain the basic principles of fluidics as they apply to the various devices and operations in mechanical services.

Fluidics Objectives
Students will:
2445.7.1 Compare and contrast basic principles of pneumatics and hydraulics, and describe devices that operate on each principle.
2445.7.2 Demonstrate typical industrial compressed air systems, explaining the various types of controls used.
2445.7.3 Memorize and use accepted practices and nomenclatures for lubricants and oils used in fluidics.
2445.7.4 Demonstrate how flow and pressure control systems, fluid pumps, motors and actuators function

Standard 8: Mechanisms (2445.S.8)
Students will understand and demonstrate the proper use of lubricants and mechanical practices.

Mechanisms Objectives
Students will:
2445.8.1 Describe friction bearings and mechanical seals and their uses.
2445.8.2 Explain the difference between oil, grease and synthetic lubricants and their use.
2445.8.3 Describe the operation of fluid motors and pumps which require alignment of drive mechanisms (shimming, etc.).
2445.8.4 Install piping, tubing and fittings used in mechanical services.

2445.8.5 Explain the difference between gears, levers, pulleys and types of bearings

Standard 9: Impacts (2445.S.9)
Students will understand the impacts and future implications of mechanical services systems as they relate to individuals, society, and the economic, environmental, and technological systems.

Impacts Objectives
Students will:

2445.9.1 Discuss several social changes brought about by the development of mechanical services technology.

2445.9.2 Explain how mechanical services technology affects our economic system and give examples.

2445.9.3 Describe positive and negative implications that various mechanical services technologies have had on the environment.

2445.9.4 Discuss a variety of future developments in mechanical services and their possible effects on society.

Transportation Systems

This course will introduce students to the use of tools and resources to relocate people and goods. Topics range from the subsystems of transportation to the sources of energy used in the industry. Students will explore various applications in transportation technology through hands on activities.

Standard 1: Background (2448.S.1)
Students will describe the transportation system, its development and importance in the world today.

Background Objectives
Students will:
2448.1.1 Define transportation technology in terms of the systems model, listing the inputs, processes, outputs and feedback and give examples of each.
2448.1.2 Identify and describe important inventions and developments in transportation technology.
2448.1.3 Determine the advantages and disadvantages of selected modes of transportation in relation to its efficiency (speed, payload, economics, safety).

Standard 2: Communication Applications (2448.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2448.2.1 Use a variety of techniques to access information and use it to solve design problems in transportation.
2448.2.2 Write a technical report explaining a specific transportation process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2448.2.3 Prepare and deliver a 3-5 minute extemporaneous speech on a given topic in transportation.
2448.2.4 Apply vocabulary and reading comprehension skills used in transportation occupations.

Standard 3: Mathematical Applications (2448.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to transportation careers.

Mathematical Applications Objectives
Students will:
2448.3.1 Perform mathematical computations as they relate to transportation activities (calculating speed, loads, lift, etc.)
2448.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: **Problem Solving (2448.S.4)**
Students will apply design, creativity and critical thinking skills to develop solutions to a variety of problems involving different technologies to meet specific criteria.

Problem Solving Objectives
Students will:
2448.4.1 Practice a variety of ways to generate ideas to solve problems.
2448.4.2 Plan and select the materials, energy, tools, and processes needed for producing solutions to transportation problems, and produce solutions for a variety of problems.
2448.4.3 Use several testing strategies to evaluate the solution to transportation problems, and analyze information gained through testing to evaluate the success of solutions.
2448.4.4 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 5: Safety (2448.S.5)

Students will develop appropriate health and safety practices associated with the transportation industry.

Safety Objectives
Students will:
2448.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the transportation laboratory.
2448.5.2 Describe safety measures and industrial laws and regulations used by transportation industries to protect workers on the job.

Standard 6: Power and Energy (2448.S.6)
Students will understand the role that energy plays in producing power for transportation and how power systems convert energy into work.

Power and Energy Objectives
Students will:
2448.6.1 Define energy and the three major categories of energy sources (renewable, non-renewable, and inexhaustible), listing several examples of each.
2448.6.2 Explain the Law of Conservation of Energy.
2448.6.3 Define mechanical advantage and describe how the six simple machines provide mechanical advantage to a vehicle.
2448.6.4 Define power and describe the three major power systems used in transportation (mechanical, electrical, fluid), listing several examples.
2448.6.5 Illustrate the types of gears used in transmission of power, and calculate gear ratio and direction.

Standard 7: Propulsion Sub-Systems (2448.S.7)
Students will explain the operation of various propulsion systems used in transportation.

Propulsion Sub-Systems Objectives
Students will:
2448.7.1 Define propulsion, and describe the three major types of energy converters used in transportation (heat engines, electric systems, hybrid systems).
2448.7.2 Describe the effect that friction has on the movement of a vehicle.
2448.7.3 Compare and contrast 2-stroke and 4-stroke engines.
2448.7.4 Compare and contrast propulsion systems used in air transport: reciprocating and jet engines.

Standard 8: Structural Sub-Systems (2448.S.8)
Students will describe the purpose of structural systems and analyze designs as to their efficiency.

Structural Sub-Systems Objectives
Students will:
2448.8.1 Explain the various structural design criteria including: human, safety, and economic factors, giving examples.
2448.8.2 Describe various materials used in vehicle structures (body, hull, fuselage) and why each is used.
2448.8.3 Design and construct a model vehicle, which demonstrates efficient aerodynamic or hydrodynamic design.

Standard 9: Suspension Sub-Systems (2448.S.9)
Students will compare and contrast various types of suspension systems and explain their purpose in vehicles.

Suspension Sub-Systems Objectives
Students will:
2448.9.1 Define suspension, and list the three types of suspension systems, giving examples of each (mechanical, fluid, magnetic).
2448.9.2 Describe the main components of suspension systems used in land transportation.
2448.9.3 Explain Bernoulli's Principle, describing the forces that affect an aircraft in flight.
2448.9.4 Define buoyancy and explain how it provides suspension to marine craft.
2448.9.5 Explain why aerodynamic devices (airfoils) are not effective in space.

Standard 10: Support Sub-Systems (2448.S.10)
Students will describe the function of support systems for the transportation industry.

Support Sub-Systems Objectives
Students will:
2448.10.1 Explain the need for each of the five types of support systems used in transportation (life, legal, operations, maintenance, economic).

Standard 11: Guidance Sub-Systems (2448.S.11)
Students will explain guidance systems and why they are an integral part of any transportation system.

Guidance Sub-Systems Objectives
Students will:
2448.11.1 Explain the purpose of guidance systems in transportation.
2448.11.2 Describe several types of visual and electronic guidance systems and give examples of where each would most commonly be found.

Standard 12: Control Sub-Systems (2448.S.12)
Students will describe the purpose of control systems in transportation systems.

Control Sub-Systems Objectives
Students will:
2448.12.1 Describe the two major categories of control systems: speed and direction.
2448.12.2 Demonstrate the concept of movement about axes (roll, pitch, yaw) in a variety of modes.
2448.12.3 Define random and fixed routes, and briefly explain directional control in both.
2448.12.4 Describe the various ways to control speed and direction in land transportation vehicles.
2448.12.5 Identify and describe the control surfaces on an aircraft and how they function.

Standard 13: Impacts (2448.S.13)
Students will examine the impacts and future implications of transportation systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:
2448.13.1 discuss several social changes brought about by technological developments in the transportation industry.
2448.13.2 Explain how our economy is affected by developments in transportation systems and give examples.
2448.13.3 Describe positive and negative implications that various transportation technologies have had on the environment.
2448.13.4 Discuss a variety of future developments in transportation and their possible effects on society, the economy and the environment.

Travel West Virginia

This course provides students with an awareness of the impact of tourism in West Virginia. Students study the eight tourism regions of the state, the history, heritage, culture and geography of the state related to tourism and the role that marketing plays in building our tourism industry. Hospitality careers are also covered.

Standard 1: Develop an appreciation for and promote a sense of pride in the state of West Virginia.
(7663.S.1)

Pride in the State Objectives
Students will:
7663.1.1 Describe and have an understanding of how stereotypes and prejudice can negatively impact West Virginia.
7663.1.2 Evaluate stereotypes used to describe West Virginia and determine their validity.
7663.1.3 List places of interest in West Virginia.
7663.1.4 Analyze slogans that promote West Virginia.
7663.1.5 Explain reasons why people should come to West Virginia.

Standard 2: Demonstrate an understanding of historical/geographical places of interest in West Virginia. (7663.S.2)

Historical/Geographical Objectives
Students will:
7663.2.1 Locate on a map the eight tourist regions of West Virginia.
7663.2.2 Draw conclusions about West Virginia's eight tourist regions from maps, pictures, charts and graphs.
7663.2.3 Explain how the physical geography of West Virginia supports tourism.
7663.2.4 Identify the location of places of historical significance in West Virginia.
7663.2.5 Identify the location of places of recreational interest in West Virginia and distinguish which are natural and man-made.
7663.2.6 Categorize historical/geographical places of interest by tourist region.
7663.2.7 Categorize historical places of interest by time period.

Standard 3: Analyze the potential for tourism in West Virginia. (7663.S.3)

Tourism Objectives
Students will:
7663.3.1 Define tourism.
7663.3.2 Identify the location and role of the Convention and Visitors' Bureaus.
7663.3.3 List reasons people travel.
7663.2.4 List the major population centers that are within a 500-mile radius of West Virginia.
7663.2.5 Evaluate misconceptions about tourism.
7663.2.6 Interpret data regarding tourism in West Virginia.
7663.2.7 List categories of tourism and give examples of each.
7663.2.8 Define target markets.
7663.2.9 List target markets for tourism and compare/contrast each.
7663.2.10 Evaluate the importance of preservation, e.g., natural beauty, historical significance vs. economic progress.
7663.2.11 Explain how ethnicity impacts tourism.
7663.2.12 Analyze data to determine leisure travel habits of potential target markets.
7663.2.13 Describe internal and external factors that motivate people to travel.

Standard 4: Explore careers in the hospitality and tourism industry. (7663.S.4)

Careers in Hospitality and Tourism Objectives
Students will:
7663.4.1 List careers in hospitality and tourism.
7663.4.2 Categorize jobs in hospitality and tourism, e.g., entry level, CEO.
7663.4.3 Explain how a hobby can become a career.
7663.4.4 Define entrepreneur.
7663.4.5 Evaluate how careers in hospitality/tourism can change over time.
7663.4.6 Compare job opportunities in each of the eight tourist regions.
7663.4.7 Identify personal traits that are necessary for a successful career in the hospitality industry.
7663.4.8 Identify benefits of a career in hospitality/tourism.
7663.4.9 Demonstrate skills necessary to ensure a successful interview.
7663.4.10 Demonstrate the ability to complete an application form.
7663.4.11 Explain the role an employee fills in promoting tourism.
7663.4.12 Describe the steps in looking for a job.
7663.4.13 Define career ladder.

Standard 5: Develop skills and competencies necessary for success in any occupation as identified by the Secretary's Commission on Achieving Necessary Skills. (SCANS) (7663.S.5)

SCANS Objectives
Students will:
7663.5.1 Define SCANS.
7663.5.2 Identify basic skills necessary for workplace competency.
7663.5.3 Identify personal skills essential for workplace competency.
7663.5.4 List the functional skills necessary for workplace success and cite examples of each.
7663.5.5 Identify workplace competencies found in everyday activities.

Standard 6: Compare economic opportunities in different regions of the state. (7663.S.6)

Economic Opportunities Objectives
Students will:
7663.6.1 List businesses affected by tourism.
7663.6.2 Categorize the effect of tourism on select businesses as direct or indirect.
7663.6.3 Assess the impact of interstate highways on the economic development of West Virginia.
7663.6.4 Explain reasons businesses locate in specific areas.
7663.6.5 Identify the role of lodging and restaurants to the promotion of tourism.
7663.6.6 Identify industries and products that are important to West Virginia's economy.
7663.6.7 Analyze the strengths and weaknesses of each of the eight tourist regions and make recommendations for economic development in each.
7663.6.8 Give examples of historical structures that have been used for economic development.
7663.6.9 Evaluate the economic impact of special events, e.g., fairs festivals.
7663.6.10 Analyze how an increase of decrease in tourism affects businesses.

Standard 7: Develop an understanding of the role marketing plays in tourism. (7663.S.7)

Role Marketing Plays in Tourism Objectives
Students will:
7663.7.1 Define marketing.
7663.7.2 List the 5 P's of marketing.
7663.7.3 Distinguish between a product and service.
7663.7.4 Evaluate the factors that make tourism a product or a service.
7663.7.5 List factors to consider when describing a target market.

7663.7.6 Explain the role market research plays in the tourist industry.
7663.7.7 Evaluate information from a variety of sources and formulate a marketing plan for your local tourist region.
7663.7.8 Describe the elements of a marketing plan.
7663.7.9 Explain how increased tourism brings added demands on public facilities/services.
7663.7.10 Explain the role promotion plays in marketing.
7663.7.11 Compare/contrast the importance of a campaign theme.

FORM HD 201
(10-66)

FISCAL NOTE WORKSHEET
(Submit 4 Copies)

HD NO _____ DRAFT NO _____ BILL NO _____ RESOLUTION NO _____ _____

SUBJECT **Policy 2520: Content Standards and Objectives for West Virginia Schools**

FUND General

SOURCE OF REVENUE: ☐ GENERAL FUND ☐ SPECIAL ☐ OTHER (SPECIFY) _____

COST OF ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

INCOME ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

SHOW OVER-ALL EFFECT IN ITEMS 1 AND 2 & GIVE EXPLANATION OF BREAKDOWN BY FISCAL YEAR INCLUDING LONG-RANGE EFFECT

EFFECT OF PROPOSAL	ANNUAL INCREASE	ANNUAL DECREASE		FISCAL YEAR CURRENT	FISCAL YEAR NEXT	FISCAL YEAR THEREAFTER	
1. ESTIMATED TOTAL COST	$ -0-	$ - 0 -		$ - 0 -	$ -0-	$ -0-	
PERSONAL SERVICES CURRENT EXPENSES REPAIRS/ALTERATIONS EQUIPMENT OTHER	$	$		$	$	$	
2. ESTIMATED TOTAL REVENUES	$ -0-	$ - 0 -		$ - 0 -	$ -0-	$ -0-	

3. EXPLANATION OF ABOVE ESTIMATES (INCLUDING LONG-RANGE EFFECT):

DATE: 4/4/02

AGENCY: West Virginia Department of Education

AUTHORIZED REPRESENTATIVE: _____

POLICY 2520
CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS
COMMENT RESPONSE FORM

Comment Period Ends: June 21, 2002

Please use this form when commenting on proposed Policy 2520. You may attach additional sheets if necessary.

Individual/Organization: _____

Title: _____

Street Address: _____

City/State/Zip Code: _____

NOTE: There are no changes to the Content Standards and Objectives for Mathematics, Reading/English Language Arts, Science, Social Studies and Technology and we will not accept comments on those sections.

General:

Agricultural Education:

Business Education:

Diversified Cooperative Training:

Family and Consumer Sciences:

Health Occupations:

Lodging Management:

Marketing Education:

Occupational Family & Consumer Science:

Technical and Industrial Education:

Policy 2520: Content Standards and Objectives for West Virginia Schools

David Stewart
State Superintendent of Schools

December 2001

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.



David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses and grades 11-12 science courses, which use no grade designation);
- The number of the content standard addressed; and
- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard.

Numbering of Performance Descriptors
The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this version of Policy 2520 is "200112.", indicating that the Board approval date is December 2001.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

MATHEMATICS

Mathematics standards have been written in response to the need to better prepare students for college, other post-secondary education, and gainful employment. The five mathematics standards, Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability, are aligned directly with the National Council of Teachers of Mathematics document, *Principles and Standards for School Mathematics* released in 2000. See http://www.nctm.org to access the NCTM document. The curriculum is designed to be ambitious and rigorous at all grade levels. This rigor is required to achieve a society that has the capability to think and reason mathematically.

The standards describe what each student of mathematics should be able to accomplish in K-12. The objectives spiral upward through the grade levels, eliminating repetition of content and increasing in rigor throughout the student's academic career. It is important that all students value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, make connections to other content areas and to the real world application of mathematics, and learn to reason mathematically.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The content and character of school mathematics provide a vision to guide educators as they strive for continual improvement of mathematics education. The following six principles for school mathematics are the major influences on the improvement of classrooms, schools and educational systems.

1. **Equity:** High expectations and strong support for all students.
2. **Curriculum:** Coherent, focused on important mathematics, and well articulated across the grades.
3. **Teaching:** Understanding what students know and need to learn and then challenging and supporting them to learn it well.
4. **Learning:** Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.
5. **Assessment:** Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.
6. **Technology:** Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.

Mathematics Content Standards K-12

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Kindergarten Mathematics Content Standards and Objectives

Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.K.1.1 count forward to 20 and backward from 10 with and without objects.
MA.K.1.2 read, write, order, and compare numbers to 20.
MA.K.1.3 count and group concrete items by ones and tens.
MA.K.1.4 identify place value of each digit utilizing standard and expanded form through 20.
MA.K.1.5 identify ordinal positions 1st – 10th and directionality.
MA.K.1.6 estimate the number of objects in a group of 20 or less and count to determine reasonableness.
MA.K.1.7 identify and name halves and whole using concrete items.
MA.K.1.9 model addition and subtraction of whole numbers using 10 or less items and write the corresponding number sentence.
MA.K.1.9 understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property).
MA.K.1.10 solve grade level appropriate problems using a variety of strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.K.2.1 sort and classify objects by one attribute.
MA.K.2.2 identify, describe, and extend a repeating pattern found in common objects, sound, and movement.
MA.K.2.3 model and identify patterns of counting by 5's and 10's.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.K.3.1 use physical materials to construct, identify, and classify basic geometric plane shapes: circle, square, rectangle, triangle.
MA.K.3.2 identify basic geometric shapes in the environment.
MA.K.3.3 describe spatial relationships: inside/outside, top/bottom, before/after.
MA.K.3.4 identify the separate parts used to make a whole object.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.K.4.1 estimate the size of an object and compare and order objects with respect to a given attribute.
MA.K.4.2 use standard and nonstandard units of measure to find the length of an object.
MA.K.4.3 compare two objects in nonstandard units of measure, according to one or more of the following attributes: length, height, weight.
MA.K.4.4 name the days of the week and the seasons of the year.
MA.K.4.5 read time to the nearest hour using analog and digital clocks.
MA.K.4.6 identify the name and value of penny, nickel, and dime.
MA.K.4.7 determine the value of a collection of pennies with a total value less than twenty cents.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.K.5.1 collect, sort and organize data as a group project.
MA.K.5.2 construct graphs using objects and pictures.
MA.K.5.3 analyze data represented on a graph using grade level appropriate questions.

First Grade Mathematics Content Standards and Objectives

The first grade objectives continue the emphasis on the use of manipulatives, concrete material, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two- and three- dimensional figures; and gathering, organizing, and explaining data. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.1.1.1	count forward to 100 and backward from 20 with and without objects.
MA.1.1.2	read, write, order, and compare numbers to 100.
MA.1.1.3	model and identify odd and even numbers to 20 with and without objects.
MA.1.1.4	count and group concrete items by ones, tens, and hundreds.
MA.1.1.5	identify place value of each digit utilizing standard and expanded form through 100.
MA.1.1.6	identify and read ordinal numbers 1st - 20th.
MA.1.1.7	estimate the number of objects in a group of 100 or less and count to determine reasonableness of estimate.
MA.1.1.8	identify and name halves, thirds, and fourths as part of a whole and as part of a group using models.
MA.1.1.9	model addition and subtraction of whole numbers using 18 or less items and write the corresponding number sentence.
MA.1.1.10	understand meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations)
MA.1.1.11	memorize basic addition facts with sums to 10 and corresponding subtraction facts.
MA.1.1.12	model 2-digit addition and subtraction without regrouping to solve the algorithm.
MA.1.1.13	add three numbers with a sum of 18 or less.
MA.1.1.14	solve grade level appropriate picture and story problems using multiple strategies.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.1.2.1 sort and classify objects by more than one attribute.
MA.1.2.2 analyze and create a repeating pattern using common objects and numbers.
MA.1.2.3 use input/output model with grade appropriate functions.
MA.1.2.4 identify and write number patterns by 2's, 5's, and 10's.
MA.1.2.5 identify and represent number patterns using words, AB form, and T-charts.
MA.1.2.6 use models to demonstrate that the quantities on each side of a number sentence are equivalent.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

MA.1.3.1 draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices.
MA.1.3.2 use physical materials to construct, identify, and classify three-dimensional figures: cube, cone, sphere, rectangular solid, pyramid, and cylinder.
MA.1.3.3 identify three-dimensional shapes in the environment.
MA.1.3.4 identify and draw open and closed figures.
MA.1.3.5 identify, determine, and draw a line of symmetry.
MA.1.3.6 identify and draw plane shapes that are congruent.
MA.1.3.7 describe spatial relationships: over/under, left/right.
MA.1.3.8 find and name locations with simple relationships on a coordinate system.
MA.1.3.9 describe the shape created by combining two or more two-dimensional shapes.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearest whole unit.
MA.1.4.2	understand appropriate grade level conversions within a system of measurement.
MA.1.4.3	compare two objects or events according to one or more of the following attributes: length, height, weight, time, temperature and volume.
MA.1.4.4	name the months of the year and find a date on a monthly calendar.
MA.1.4.5	explain time concept in context of personal experience.
MA.1.4.6	read time to the half hour using an analog and digital clock.
MA.1.4.7	calculate elapsed time to the hour.
MA.1.4.8	identify the name and value of quarter and dollar.
MA.1.4.9	count and trade a collection of pennies, nickels, and dimes with a total value of 100 cents or less.
MA.1.4.10	role-play making change up to a dime.
MA.1.4.11	select the appropriate tools of measurement to determine length, weight, volume and temperature.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.1.5.1	identify and investigate various forms of data collection.
MA.1.5.2	read and interpret a pictograph with each picture representing a single unit.
MA.1.5.3	conduct simple experiments and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.
MA.1.5.4	discuss events related to students' experiences as likely or unlikely.
MA.1.5.5	tally by one's, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables.
MA.1.5.6	analyze data represented on a graph using grade level appropriate questions.

Second Grade Mathematics Content Standards and Objectives

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. These concepts include: place value through thousands, estimation, introduction of properties of mathematics, and measurement which includes spatial perception. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.2.1.1	read, write, order, and compare numbers to 1000.
MA.2.1.2	identify any number as odd or even.
MA.2.1.3	count and group concrete items by 1's, 10's, 100's, and 1000's.
MA.2.1.4	identify place value of each digit utilizing standard and expanded form through 1000.
MA.2.1.5	identify and read any ordinal number.
MA.2.1.6	round to nearer 10 and 100 to better understand place value.
MA.2.1.7	identify and name fractions as part of a whole and as part of a group using models.
MA.2.1.8	understand meaning of operations and the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).
MA.2.1.9	memorize basic addition facts with sums to 18 and corresponding subtraction facts.
MA.2.1.10	model 2- and 3-digit addition and subtraction without and with regrouping to solve the algorithm.
MA.2.1.11	use rounding to determine the reasonableness of a sum or a difference.
MA.2.1.12	solve grade level appropriate story problems that require one or two-step solutions using multiple strategies.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.2.2.1	analyze, describe, extend and create a growing pattern.
MA.2.2.2	use input/output model with grade appropriate functions.
MA.2.2.3	model and identify patterns of counting by 3's and 4's.
MA.2.2.4	given the rule, complete the pattern.
MA.2.2.5	use models to demonstrate equivalency of two numerical expressions written as a number sentence.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.2.3.1	identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces and edges.
MA.2.3.2	compare and contrast plane and solid geometric shapes.
MA.2.3.3	given a design with a line of symmetry, draw the mirror image.
MA.2.3.4	model line segments and angles.
MA.2.3.5	identify the congruent shape that has been rotated and/or reflected.
MA.2.3.6	plot locations with simple relationships on a coordinate plane.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.2.4.1	use a ruler to draw and compare lengths given lengths in centimeters and inches.
MA.2.4.2	estimate and determine the perimeter of a polygon.
MA.2.4.3	estimate and count the number of square units needed to cover a given area.
MA.2.4.4	understand appropriate grade level conversions within a system of measurement.
MA.2.4.5	estimate and determine weight/mass of familiar objects in pounds and kilograms.
MA.2.4.6	order events in relation to time.
MA.2.4.7	given a calendar, determine past and future dates of the week and identify specific dates.
MA.2.4.8	read time to the nearest quarter hour using an analog and digital clock.
MA.2.4.9	calculate elapsed time to the half hour.
MA.2.4.10	read and write amounts of money to a dollar.
MA.2.4.11	role-play making change to a dollar.
MA.2.4.12	read Celsius and Fahrenheit thermometers.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.2.5.1 create, read, and interpret a pictograph with each picture representing greater than or less than a simple unit.
MA.2.5.2 conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.
MA.2.5.3 analyze data represented on a graph using grade level appropriate questions.
MA.2.5.4 formulate questions, collect data, organize and display as a chart/graph.

Third Grade Mathematics Content Standards and Objectives

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to hundredths and ten thousands; fractions and decimals; multiplication facts through five with corresponding division facts. Additional concepts include gathering and organizing data, estimating and performing measurements. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.3.1.1 read, write, order, and compare numbers to 10,000.
MA.3.1.2 read, write, order, and compare decimals to hundredths with models.
MA.3.1.3 identify place value of each digit utilizing standard and expanded form through 10,000.
MA.3.1.4 estimate to nearer 1000 using rounding, benchmarks, and compatible numbers to determine reasonableness of an answer.
MA.3.1.5 identify fractions as part of a whole/one and as part of a group using models and pictorial representations.
MA.3.1.6 compare and order fractions with like and unlike denominators using concrete models.
MA.3.1.7 add and subtract fractions with like denominators using concrete models and pictorial representations.

MA.3.1.8 recognize and model equivalent fractions using concrete materials.
MA.3.1.9 recognize and model proper and improper fractions and mixed numbers.
MA.3.1.10 add and subtract 2- and 3-digit whole numbers and money without and with regrouping.
MA.3.1.11 understand multiplication as repeated addition and division as repeated subtraction.
MA.3.1.12 understand meanings of operations and the relationship between multiplication and division (e.g., identity element of multiplication, commutative property, property of zero, fact families, associative property).
MA.3.1.13 memorize basic multiplication facts 0-5 and the corresponding division facts.
MA.3.1.14 model multiplication of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.15 model division of 2- and 3-digit numbers by a 1-digit number.
MA.3.1.16 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students apply their knowledge of benchmarks to solve problems involving comparing, adding, and subtracting decimals and fractions with like denominators; and know multiplication facts through 9's and the corresponding division facts.
- **Mastery**
  Third grade students performing at mastery level represent fractions and decimals using number lines, models and pictures, memorize multiplication facts through 5's and the corresponding division facts, compare numbers from 100ths to 10,000, estimate, add and subtract whole numbers, and use estimation to determine the reasonableness of an answer.
- **Partial Mastery**
  Third grade students performing at the partial mastery level represent fractions and decimals using models and pictures, recall multiplication facts through 5's and the corresponding division facts, read and write numbers from 100ths to 10,000, and estimate, add, and subtract whole numbers without regrouping.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.3.2.1 analyze and complete a geometric pattern.
MA.3.2.2 use input/output model with grade appropriate functions.
MA.3.2.3 identify and write number patterns of 3's and 4's.
MA.3.2.4 identify and write the rule of a given pattern.
MA.3.2.5 write equivalent numerical expressions.
MA.3.2.6 represent the idea of a variable as an unknown quantity using a symbol.

Performance Descriptors (MA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level determine the input, when given the output of a function and use algebraic methods to generalize and write the rules for patterns.

- **Mastery**
  Third grade students performing at mastery level use algebraic methods to generalize and write the rules for patterns.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.3.3.1 identify basic polygons and their components through decagon.
MA.3.3.2 identify and describe a cube, rectangular solid, cylinder, cone and pyramid according to the number of faces, edges and vertices.
MA.3.3.3 from a plane drawing, construct and identify the solid figure.
MA.3.3.4 identify, determine and draw lines of symmetry.
MA.3.3.5 describe lines and rays.
MA.3.3.6 identify and draw right, obtuse and acute angles.
MA.3.3.7 given a model, draw an example of a flip, slide and turn.
MA.3.3.8 name the location of a point on a one-quadrant grid.

Performance Descriptors (MA.PD.3.3)
- **Distinguished**
  Third grade students performing at the distinguished level generalize the similarities and differences among plane and solid figures; describe spatial relationships using coordinate geometry; and draw acute, right, and obtuse angles.
- **Mastery**
  Third grade students performing at mastery level identify basic polygons and their components; describe geometric solids according to faces, edges and vertices; and draw acute, right and obtuse angles. Students name the location of a point in the first quadrant.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify basic polygons and their components, describe geometric solids, and identify angles. Students name the location of a point in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.3.4.1 estimate, measure, compare, order and draw lengths using inches (to the nearest ½ inch), feet, yards, centimeters and meters.

MA.3.4.2 estimate and count the number of cubes in a rectangular solid to determine volume.

MA.3.4.3 discover the formula for determining the area of a rectangle.

MA.3.4.4 understand appropriate grade level conversions within a system of measure.

MA.3.4.5 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms.

MA.3.4.6 read time to 5-minute intervals using analog and digital clocks.

MA.3.4.7 calculate elapsed time to quarter-hour.

MA.3.4.8 read and write amounts of money to $100.00.

MA.3.4.9 role-play making change up to $10.00.

MA.3.4.10 estimate, read, and recognize common temperatures of Celsius and Fahrenheit.

Performance Descriptors (MA.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level estimate and compare measures of length, weight, and temperature, tell time to the nearest five minutes, calculate elapsed time to the quarter hour, and make change up to $10.00 in problem solving situations.
- **Mastery**
  Third grade students performing at mastery level estimate and compare measures of length, weight, and temperature, tell time to nearest 5 minutes and calculate elapsed time to the quarter hour, and make change up to $10.00.
- **Partial Mastery**
  Third grade students performing at the partial mastery level measure length, weight, and temperature, tell time to nearest 5 minutes, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.3.5.1 collect data from observation, surveys, and experiments, and construct and label the graph.

MA.3.5.2 use a timeline to determine a sequence of events.

MA.3.5.3 experiment and describe concepts of probability and chance and list possible outcomes from a sampling.

MA.3.5.4 analyze data represented on a graph by generating questions using grade level appropriate questions.

Performance Descriptors (MA.PD.3.5)

- **Distinguished**
  Third grade students performing at distinguished level analyze data from a graph or an experiment by generating questions and calculate the mean.

- **Mastery**
  Third grade students performing at the mastery level organize collected data, calculate the mean, and draw conclusions from a graph or an experiment.
- **Partial Mastery**
  Third grade students performing at the partial mastery level collect, organize, and display data.

Fourth Grade Mathematics Content Standards and Objectives

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two-and three-digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, and adding and subtracting decimals. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.4.1.1 read, write, order, and compare numbers to 1,000,000.
MA.4.1.2 read, write, order, and compare decimals to thousandths with and without models and pictorial representations.
MA.4.1.3 identify place value of each digit utilizing standard and expanded form through 1,000.000.
MA.4.1.4 estimate to nearer 10,000 using rounding, benchmarks, and compatible numbers and identify over and under estimates to determine reasonableness of an answer.
MA.4.1.5 compare and order fractions with like and unlike denominators using pictorial representations.
MA.4.1.6 add and subtract fractions with like and unlike denominators using pictorial representations.
MA.4.1.7 recognize and model equivalent fractions using pictorial representations.
MA.4.1.8 model addition and subtraction of mixed numbers without and with regrouping to solve the algorithm.
MA.4.1.9 understand the relationship of fractions to decimals using concrete objects and pictorial representations.
MA.4.1.10 round decimals to the nearest whole, 10th, or 100th.
MA.4.1.11 add and subtract decimals to the 1000th place.
MA.4.1.12 apply the distributive property of multiplication over addition.
MA.4.1.13 memorize basic multiplication facts and corresponding division facts.
MA.4.1.14 multiply 2-and 3-digit numbers by 1- and 2-digit numbers.
MA.4.1.15 divide 2-and 3-digit numbers by 1-and 2-digit numbers.
MA.4.1.16 apply the order of operations in solving problems.

MA.4.1.17 solve grade level appropriate story problems using multiple strategies.

Performance Descriptors (MA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level choose the operation, solve problems, and justify answers. Students add and subtract fractions and decimals; multiply and divide whole numbers in problem solving situations; compare numbers from 1000ths to 1,000,000; and apply order of operations to solve problems.
- **Mastery**
  Fourth grade students performing at mastery level demonstrate mastery of all basic facts, add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, compare numbers from 1000ths to 1,000,000, and apply order of operations to solve problems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level add and subtract fractions and decimals with pictorial representation, multiply and divide whole numbers in problem solving situations, and compare numbers from 1000ths to 1,000,000.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.4.2.1 solve problems, involving patterns.
MA.4.2.2 use input/output model with grade appropriate functions.
MA.4.2.3 understand the relationship between number patterns and multiples.
MA.4.2.4 use patterns to predict the nth term.
MA.4.2.5 represent the idea of a variable as an unknown quantity using a letter.

Performance Descriptors (MA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write an expression using a variable to represent the unknown quantity in problem-solving situations and predict a pattern to the nth term.
- **Mastery**
  Fourth grade students performing at mastery level predict a pattern to the nth term.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level use algebraic methods to extend a pattern.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.4.3.1 identify plane figures and their components.
MA.4.3.2 compare and contrast quadrilateral shapes.
MA.4.3.3 describe three-dimensional objects from different perspectives.
MA.4.3.4 identify and draw intersecting, parallel, and perpendicular lines.
MA.4.3.5 draw, label, compare, and classify acute, right, and obtuse angles.
MA.4.3.6 draw a design with one line of symmetry.
MA.4.3.7 graph/plot ordered pairs on a one-quadrant grid.
MA.4.3.8 draw and identify parts of a circle: center point, diameter, and radius.

Performance Descriptors (MA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level match orthogonal drawings and nets to three-dimensional figures, create figures that include given geometric properties, and plot and graph ordered pairs in the first quadrant.
- **Mastery**
  Fourth grade students performing at mastery level compare and contrast quadrilaterals, describe three-dimensional objects from different perspectives, classify angles, and draw lines that are parallel, perpendicular, and intersecting. Students draw and label parts of a circle and plot and graph ordered pairs in the first quadrant.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level classify lines, angles, and quadrilaterals and identify three-dimensional objects from different perspectives; plot and graph ordered pairs in the first quadrant.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.4.4.1 estimate, measure, compare, order and draw lengths using customary and metric units.
MA.4.4.2 determine and compare areas of rectangles and squares by multiplying length and width.
MA.4.4.3 discover the formula for volume of a rectangular prism.
MA.4.4.4 understand appropriate grade level conversions within a system of measure.
MA.4.4.5 read scales of weight, capacity, and temperature and select appropriate unit.
MA.4.4.6 read time to nearest minute.

MA.4.4.7 determine elapsed time in hours/ minutes within a 24-hour period.
MA.4.4.8 count coins and bills and determine correct change.

Performance Descriptors (MA.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level solve problems involving measures of volume and capacity, perimeter and area, elapsed time and money, and convert units within a system of measurement.
- **Mastery**
  Fourth grade students performing at mastery level estimate and compare measures of volume and capacity, estimate and compare areas of rectangles, tell time to the nearest minute and calculate elapsed time in a 24-hour period, and calculate change in problem solving situations using money.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level measure volume and capacity, determine the area of rectangles, tell time to the nearest minute, and calculate change.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives

Students will:

MA.4.5.1 understand and reason about the use and misuse of statistics in our society.
MA.4.5.2 read and interpret information represented on a circle graph.
MA.4.5.3 collect, organize, display, read and interpret data from a problem solving situation in line graphs, bar graphs, tally charts and tables with scale increments greater than one.
MA.4.5.4 list all possible outcomes for an experiment using a tree diagram.
MA.4.5.5 determine mean, median, mode and range from collected data.

Performance Descriptors (MA.PD.4.5)

- **Distinguished**
  Fourth grade students performing at distinguished level calculate the mode, median and range; and make inferences and predictions based on data from line graphs, circle graphs and tree diagrams.
- **Mastery**
  Fourth grade students performing at the mastery level collect (whole number) data and calculate the mode, median, and range. Students read and interpret data represented by line graphs, circle graphs, and tree diagrams.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read data represented with line graphs, circle graphs, and tree diagrams.

Fifth Grade Mathematics Content Standards and Objectives

Building on mastery of the basic facts of addition, subtraction, multiplication, and division, the fifth grade objectives place emphasis on developing proficiency in using whole numbers, fractions, and decimals to solve problems. Students will collect, display and analyze data in a variety of ways and solve probability problems. Students will solve problems involving area and perimeter, will classify polygons, plot points on a coordinate plane, and write a number sentence using a variable to solve problems. Students should be actively engaged, continuing to use concrete materials and appropriate technologies such as calculators and computers. Problem solving should be integrated throughout all the strands. The development of a variety of problem-solving strategies should be a major goal of mathematics at this grade level. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.5.1.1 read, write, order and compare all whole numbers.
MA.5.1.2 read, write, order and compare all decimals.
MA.5.1.3 identify place value of each digit utilizing standard and expanded form in any whole number.
MA.5.1.4 estimate with whole numbers and decimals, including money, to determine reasonableness of an answer.
MA.5.1.5 identify and use the divisibility rules of 2, 3, 5, 9 and 10.
MA.5.1.6 compare and order fractions, improper fractions and mixed numbers with like and unlike denominators (e.g., greatest common factor, lowest common multiple).
MA.5.1.7 model and write equivalencies of fractions, decimals, percents, and ratios.
MA.5.1.8 add and subtract fractions and mixed numbers.
MA.5.1.9 model multiplication and division of fractions to solve the algorithm.
MA.5.1.10 model multiplication of decimals and division of decimals by a whole number divisor to solve the algorithm.
MA.5.1.11 develop fluency in addition, subtraction, multiplication and division of whole numbers.
MA.5.1.12 solve grade level appropriate story problems using multiple strategies.
MA.5.1.13 state fractions in lowest terms.

Performance Descriptors (MA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level choose the operation, solve problems, and justify answers, multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms.
- **Mastery**
  Fifth grade students performing at mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers and give answers in lowest terms, and choose the appropriate operation and solve problems.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level multiply and divide fractions and decimals with pictorial representation, add and subtract fractions and mixed numbers terms, and choose the appropriate operation to solve problems.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:
MA.5.2.1 explore a variety of patterns with missing elements (e.g., square numbers, powers, triangular numbers, arithmetic sequences).
MA.5.2.2 use input/output model with grade appropriate functions.
MA.5.2.3 write a number sentence using a variable to solve problems.
MA.5.2.4 evaluate an expression given a value for the variable.

Performance Descriptors (MA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level describe how a change in one variable relates to a change in another and write number sentences using a variable to solve problems.
- **Mastery**
  Fifth grade students performing at the mastery level write number sentences using a variable to solve problems.
- **Partial Mastery**
  Fifth grades students performing at the partial mastery level use algebraic methods to extend a pattern and evaluate an expression.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
MA.5.3.1 classify and compare polygons.
MA.5.3.2 construct a 3-dimensional figure from different views (orthogonal drawings).
MA.5.3.3 measure angles using a protractor.
MA.5.3.4 draw a design with more than one line of symmetry.
MA.5.3.5 recognize the images of figures after reflections, translations and rotations.
MA.5.3.6 draw a similar figure using a scale.

Performance Descriptors (MA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level draw angles using a protractor, create a net when given a solid, and describe a series of motions to show that two shapes are congruent.
- **Mastery**
  Fifth grade students performing at mastery level classify and compare polygons, measure angles using a protractor, and draw a design with more than one line of symmetry.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level classify polygons, measure angles using a protractor, and identify more than one line of symmetry when given a figure.

Standard 4: Measurement (MA.S.4)

Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives

Students will:

MA.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.
MA.5.4.2	determine and compare area of triangles and parallelograms using appropriate formula.
MA.5.4.3	solve problems using the formulas for determining volume of a rectangular prism.
MA.5.4.4	understand the relationship between area and perimeter of a plane figure.
MA.5.4.5	understand appropriate grade level conversions within a system of measure and apply to problem solving situations.
MA.5.4.6	evaluate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms.
MA.5.4.7	calculate elapsed time.
MA.5.4.8	select appropriate customary and metric units and the tools for measuring to desired degree of precision.
MA.5.4.9	determine actual measurement from scale drawings.

Performance Descriptors (MA.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level apply appropriate tools, techniques, and formulas to determine measurements in problem solving situations. Students apply simple unit conversions within a system of measurement to solve problems.
- **Mastery**
  Fifth grade students performing at mastery level determine and compare area and perimeter of triangles and quadrilaterals using formulas, calculate elapsed time involving more than a 24-hour span, and select appropriate tools, formulas, and/or units of measure in problem solving situations.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level determine area and perimeter of triangles and quadrilaterals and calculate elapsed time within a 24-hour span.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.5.5.1 collect, organize, display, read and interpret data from a problem-solving situation in a stem and leaf plot.

MA.5.5.2 identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results.

MA.5.5.3 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions.

MA.5.5.4 model situations by carrying out experiments to determine probability.

MA.5.5.5 construct a circle graph.

Performance Descriptors (MA.PD.5.5)

- **Distinguished**
  Fifth grade students performing at distinguished level make inferences and predictions based on data from stem and leaf plots and circle graphs, and carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Mastery**
  Fifth grade students performing at the mastery level interpret stem and leaf plots and construct circle graphs. Students make predictions, carry out probability experiments, interpret a sample space, and compare their predictions to their results.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read a stem and leaf plot and verify predictions based on probability experiments.

Sixth Grade Mathematics Content Standards and Objectives

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals and fractions. However, students need opportunities to apply their skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume and surface area. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.6.1.1 read, write, order, and compare numbers using scientific notation.
MA.6.1.2 identify prime and composite numbers up to 100.
MA.6.1.3 use prime factorization to determine the greatest common factor and least common multiple.
MA.6.1.4 identify and represent integers on a number line.
MA.6.1.5 use estimation to solve problems with whole numbers, fractions and decimals.
MA.6.1.6 solve problems in context involving addition, subtraction, multiplication, and division of whole numbers, fractions, mixed numbers and decimals.
MA.6.1.7 identify, demonstrate, and apply the distributive, commutative, associative and identity properties.
MA.6.1.8 convert between fractions, mixed numbers, decimals and percents.
MA.6.1.9 find the percent of a number.

Performance Descriptors (MA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level solve problems involving fractions, decimals, and percents less than one and greater than 100, and relatively prime numbers, and use the commutative, associative, identity, and distributive properties to solve problems. Students compare integers and represent numbers with prime factors in exponential form.
- **Mastery**
  Sixth grade students performing at mastery level solve problems involving fractions, decimals and percents. Students use the commutative, associative, identity, and distributive properties to solve problems. Students represent integers with manipulatives and on a number line. Students represent numbers with prime factorizations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve problems involving fractions and decimals and identify commutative, associative, and identity properties and find prime factorization of a number using a factor tree.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives
Students will:

MA.6.2.1 simplify numerical expressions using order of operations.
MA.6.2.2 identify missing elements in arithmetic and geometric patterns.

MA.6.2.3 explore a variety of patterns, including perfect squares, square roots and exponents.
MA.6.2.4 use input/output models and spreadsheets to evaluate functions.
MA.6.2.5 solve a proportion using cross multiplication.
MA.6.2.6 identify like terms and monomials.
MA.6.2.7 model addition, subtraction, multiplication and division of integers.
MA.6.2.8 locate and plot points within the four quadrants.
MA.6.2.9 use variables to represent and solve real world problems appropriate for the 6th grade using multiple strategies.

Performance Descriptors (MA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at distinguished level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations. Students explain patterns in a clear concise manner.
- **Mastery**
  Sixth grade students performing at mastery level solve proportions, plot points in four quadrants, and simplify numerical expressions using order of operations. Students use manipulatives and/or drawings to model monomials, algebraic expressions, patterns, and equations.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level solve a proportion by cross-multiplying, plot points in the first quadrant, simplify numerical expressions using order of operations, and use manipulatives and/or drawings to model monomials, algebraic expressions and equations.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.6.3.1 classify lines as parallel, intersecting, perpendicular or skew.
MA.6.3.2 determine the sum of measures of angles in polygons.
MA.6.3.3 bisect a line segment using a compass and straightedge.
MA.6.3.4 draw an angle of a given measure.
MA.6.3.5 identify line symmetry and rotational symmetry in plane figures.
MA.6.3.6 define and sketch similar and congruent plane geometric figures.

Performance Descriptors (MA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at distinguished level solve problems involving congruence and similarity of plane figures, calculate the sum of measures of angles in polygons, and compare and contrast line and rotational symmetry in plane figures.

- **Mastery**
  Sixth grade students performing at mastery level solve problems involving congruence and similarities of plane figures and calculate the sum of the measures of angles of polygons. Students identify rotational symmetry in plane figures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify and describe congruence and similarity of plane figures, calculate the sum of the measures of the angles of a triangle and quadrilaterals. Students identify rotational symmetry in plane figures.

Standard 4: Measurement (MA.S.4)
Students will:
- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:
MA.6.4.1 derive approximation for pi using actual measurements.
MA.6.4.2 apply formulas to determine perimeter, circumference and/or area of plane figures including compound figures.
MA.6.4.3 investigate and model volume and surface area.
MA.6.4.4 select appropriate units and determine length, weight/mass and capacity/volume using metric and customary systems.
MA.6.4.5 construct scale drawings.

Performance Descriptors (MA.PD.6.4)
- **Distinguished**
  Sixth grade students performing at distinguished level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve application problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Mastery**
  Sixth grade students performing at mastery level calculate circumference, area, perimeter of plane figures, volume and surface area of three-dimensional figures, and give solutions in appropriate units. Students determine scale factor of similar plane figures and solve problems related to measurement. Students convert between units of measure within the metric and customary systems.
- **Partial Mastery**
  Sixth grade students performing at partial mastery level calculate perimeter and area of plane figures, the circumference of circles and the volume of a rectangular prism. Students determine the scale factor of similar figures, solve simple problems related to measurement and give solutions in appropriate units. Students convert between units of measure within the customary system.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:
- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.6.5.1 use spreadsheet software and graphing calculators to collect, organize, display, and read data using appropriate graphs and tables.
MA.6.5.2 interpret data using mean, median, mode, and range.
MA.6.5.3 determine the probability of a given event and express that probability as a ratio, decimal or percent.
MA.6.5.4 determine combinations, permutations and probability using sample spaces (by listing and tree diagrams).

Performance Descriptors (MA.PD.6.5)

- **Distinguished**
  Sixth grade students performing at distinguished level make conjectures about the outcomes of events based on simulations, and construct and interpret graphs, and interpret measures of central tendency and dispersion involving fractions and decimals. Students find combinations and permutations.
- **Mastery**
  Sixth grade students performing at mastery level calculate measures of central tendency and dispersion involving fractions and decimals. Students find the probability of an event, use combinations and permutations, and interpret graphs.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read a histogram and record data; calculate measures of central tendency and dispersion. Students find the probability of an event, and determine combinations.

Seventh Grade Mathematics Content Standards and Objectives

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability and statistics. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)
Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives
Students will:

MA.7.1.1 compare and order integers, decimals, and fractions using symbols (<,>,=) manipulatives and graphing on a number line.

MA.7.1.2 find powers, squares, and square roots using manipulatives, models, calculators, tables and mental math.
MA.7.1.3 define absolute value and determine its effect on a number or expression.
MA.7.1.4 recognize and write rational numbers in the form a/b.
MA.7.1.5 perform operations with integers (e.g., addition, subtraction, multiplication, division).
MA.7.1.6 apply the commutative, associative, distributive, identity and inverse properties.
MA.7.1.7 solve application problems with whole numbers, decimals, fractions and percents.
MA.7.1.8 use appropriate estimation strategies in problem situations including evaluating the reasonableness of a solution.

Performance Descriptors (MA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level calculate powers, square roots, and absolute values and perform operations with integers. Students solve complex application problems and evaluate the reasonableness of solutions.
- **Mastery**
  Seventh grade students performing at mastery level calculate powers, square roots, and absolute values and perform operations with integers. Students solve application problems and evaluate the reasonableness of solutions.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level calculate powers, and absolute values; perform addition, multiplication and division with integers; and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.7.2.1 find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.
MA.7.2.2 simplify and evaluate numerical and algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations and exponential rules.
MA.7.2.3 add, subtract, multiply and divide monomials.
MA.7.2.4 find and use the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of a set of monomials or algebraic fractions using prime factorization and exponent rules.
MA.7.2.5 input data into a spreadsheet to create input/output function tables.
MA.7.2.6 use ratios and proportions to represent and solve application problems.
MA.7.2.7 write and evaluate complex algebraic expressions for word phrases.
MA.7.2.8 use and apply scientific notation containing positive and negative exponents in problem solving situations.
MA.7.2.9 solve linear equations containing whole numbers, fractions, decimals and integers.
MA.7.2.10 solve inequalities using inverse operations and graph solutions.
MA.7.2.11 plot lines within the Cartesian coordinate plane from a table of values using the graphing calculator and dynamic geometry software.
MA.7.2.12 determine the slope of a line from its graphical representation.
MA.7.2.13 represent and solve real world problems appropriate for 7th grade using multiple strategies.

Performance Descriptors (MA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at distinguished level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving complex problems.
- **Mastery**
  Seventh grade students performing at mastery level solve linear equations and inequalities, graph solutions, and graph lines within the coordinate plane. Students use ratio and proportion, scientific notation, and absolute value in solving problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve linear equations, graph lines within the coordinate plane, and solve simple problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)

Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives

Students will:

MA.7.3.1	identify and construct angle-pairs (e.g., adjacent, complementary, supplementary, vertical).
MA.7.3.2	use a formula to determine the sum of the measures of the interior angles of a polygon.
MA.7.3.3	use 2-dimensional representations of 3-dimensional objects to visualize and solve problems.
MA.7.3.4	construct congruent segments and angles, perpendicular bisectors of segments and angle-bisectors.
MA.7.3.5	apply and demonstrate line symmetry.
MA.7.3.6	apply transformations (rotations, reflections, translations) to plane figures using graph paper.
MA.7.3.7	solve ratio and proportion problems including scale drawings and similar polygons.

Performance Descriptors (MA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at distinguished level solve practical problems involving similar figures, construct and bisect congruent segments and angles using a compass and straightedge. Students identify angle pairs and calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane.
- **Mastery**
  Seventh grade students performing at mastery level identify angle pairs and use formulas to calculate measures of interior angles of a polygon. Students determine types of symmetry and transformations on a coordinate plane and construct congruent segments and angles using a compass and straightedge. Students solve practical problems involving scale models.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify angle pairs, determine types of symmetry and transformations on a coordinate plane, and construct congruent segments and angles using a compass and straightedge.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.7.4.1 use and apply formulas in problem solving situations involving perimeter, circumference, area, surface area, distance and temperature (Celsius, Fahrenheit).
MA.7.4.2 use the concept of volume for prisms, pyramids, and cylinders as the relationship between the area of the base and height.
MA.7.4.3 use the Pythagorean Theorem to find the length of any side of a right triangle.
MA.7.4.4 convert units of measurement between customary and metric systems.

Performance Descriptors (MA.PD. 7.4)

- **Distinguished**
  Seventh grade students performing at distinguished level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms, pyramids, cones and cylinders and give solutions in appropriate units. Students select the correct formula from a list to solve distance, temperature, and Pythagorean Theorem problems.
- **Mastery**
  Seventh grade students performing at mastery level solve problems involving perimeter, circumference, area of two-dimensional figures, and surface area and volume of prisms and pyramids and give solutions in appropriate units. Students use the substitution property to solve distance, temperature, and Pythagorean Theorem problems.
- **Partial Mastery**
  Seventh grade students performing at partial mastery level solve problems using given formulas involving perimeter, circumference, area of regular polygons, circles, volume of prisms, and surface area of rectangular prisms. Students calculate slope of a line.

Standard 5: Data Analysis and Probability
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives (MA.S.5)
Students will:

MA.7.5.1 make and test conjectures based on probability results of experiments and simulations using appropriate technology.
MA.7.5.2 construct sample spaces by listing, tree diagrams, and frequency distribution tables to determine combinations and permutations.
MA.7.5.3 collect, organize, graphically represent, and interpret data displays including: frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs using spreadsheet and graphing calculators.

MA.7.5.4 solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology.

Performance Descriptors (MA.PD.7.5)

- **Distinguished**
  Seventh grade students performing at distinguished level find, use, and interpret interquartile range of a data set; and solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker and multiple-line graphs. Students determine if an event is dependent or independent, calculate the probability, and describe the outcome.
- **Mastery**
  Seventh grade students performing at mastery level solve application problems involving measures of central tendency and dispersion. Students collect, organize, and graphically represent frequency distributions, line-plots, scatter plots, box and whisker, and multiple-line graphs.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level calculate measures of central tendency and dispersion; collect, organize, and graphically represent data in frequency distributions, line plots and scatter plots; and compute probability of an independent event.

Eighth Grade Mathematics Content Standards and Objectives

Pre-Geometry with Algebra provides an alternative course for students who do not elect to take Algebra I in the eighth grade or who have not successfully mastered the new skills from *Pre-Algebra with Geometry* in the seventh grade. In addition to reinforcing the concepts presented in *Pre-Algebra with Geometry*, this course extends problem solving to a more sophisticated level. Students will continue to apply integer operations, properties, expressions and equations so as to reinforce these concepts in varied applications. Lessons involving cooperative learning, manipulatives, or technology will strengthen students' understanding of concepts while fostering communication and reasoning skills. Calculator use is emphasized for all mathematical tasks including assessment. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Number and Operations Objectives

Students will:

MA.8.1.1 compare and order rational and irrational numbers.

MA.8.1.2 utilize the properties of terminating, repeating, and non-repeating decimals, and conversions between fractions, mixed numbers, and decimals.

MA.8.1.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate.

MA.8.1.4 use powers, squares, and square roots to solve problems.
MA.8.1.5 solve consumer application problems including rates, tips, discounts, sales tax and interest.
MA.8.1.6 use estimation techniques with whole numbers, decimals, percent, fractions and mixed numbers to solve and verify solutions in application problems.
MA.8.1.7 solve application problems with whole numbers, decimals, fractions, percents and integers.
MA.8.1.8 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties.

Performance Descriptors (MA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve complex application problems and justify solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level apply properties and solve problems involving pi, non-repeating decimals, scientific notation, powers, and square roots. Students solve consumer application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level identify properties and solve problems involving rational numbers and solve simple application problems.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra Objectives

Students will:

MA.8.2.1 use order-of-operations and exponents rules to solve application problems with numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions and exponents.
MA.8.2.2 solve one and two step linear equations and inequalities with integers, fractions, and decimall solutions using paper and pencil, and graphing calculators.
MA.8.2.3 use ratio and proportion to create and solve equations.
MA.8.2.4 add and subtract polynomials.
MA.8.2.5 apply algebraic equations and expressions to solve application problems.
MA.8.2.6 apply inductive and deductive reasoning to write a rule from data in a function table.
MA.8.2.7 graph linear equations and inequalities within the Cartesian coordinate plane using ordered pairs, table of values, graphing calculators and dynamic geometry software.
MA.8.2.8 formulate and apply a rule to generate a arithmetic, geometric and algebraic pattern.
MA.8.2.9 determine the slope of a line given two-points or slope/y-intercept equation (y=mx+b).
MA.8.2.10 represent and solve real world problems appropriate for 8th grade using multiple strategies.

Performance Descriptors (MA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at distinguished level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve complex application problems and explain solutions in a clear concise manner.

- **Mastery**
  Eighth grade students performing at mastery level solve two-step linear equations and inequalities, and graph linear equations and inequalities. Students select and apply algebraic equations, ratio and proportion, and function rules to solve application problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve two-step linear equations, graph linear equations, and solve problems using ratio and proportion.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:

MA.8.3.1 investigate the relationship between corresponding, alternate interior, and alternate exterior angles when parallel lines are cut by a transversal using models, pencil/paper and graphing calculator.

MA.8.3.2 classify polyhedrons according to the number and shape of faces; determine the relationship between vertices, faces and edges.

MA.8.3.3 construct perpendicular and angle bisectors.

MA.8.3.4 create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations).

MA.8.3.5 use coordinate geometry to represent and examine properties of similar and congruent figures and graph transformations.

MA.8.3.6 create scale models including transformations, ratio, proportion and similar figures using pencil/paper and dynamic geometry software.

Performance Descriptors (MA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at distinguished level create and describe scale models and geometric patterns, solve problems using angle relationships formed by parallel lines cut by a transversal, construct angle bisectors and transformations, and identify relationships between faces, vertices and edges in polyhedra.
- **Mastery**
  Eighth grade students performing at mastery level solve problems involving scale models, similar figures, and geometric patterns. Students determine angle relationships when parallel lines are cut by a transversal and construct angle bisectors and transformations. Students identify relationships between faces, vertices and edges in regular polyhedra.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level solve problems with scale models and simple geometric patterns, and determine angle relationships when parallel lines are cut by a transversal.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Measurement Objectives
Students will:

MA.8.4.1 estimate and solve application problems involving perimeter, area, surface area and volume of plane and solid geometric figures.

MA.8.4.2 use the concept of volume for cone and pyramids as one-third the product of the area of the base and the height.

MA.8.4.3 solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.

MA.8.4.4 solve right triangle problems using the Pythagorean Theorem, indirect measurement and definitions.

Performance Descriptors (MA.PD.8.4)

- **Distinguished**
  Eighth grade students performing at distinguished level solve complex application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units explaining solutions in a clear concise manner. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems explaining solutions in a clear concise manner.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving perimeter, area, surface area, volume, and missing measurements of geometric figures and give solutions in appropriate units. Students determine slope of a line given two points and the slope-intercept form of an equation of a line. Students apply the Pythagorean Theorem to solve problems.
- **Partial Mastery**
  Eighth grade students performing at partial mastery level solve simple application problems involving perimeter, area, surface area and volume of geometric figures; calculate slope of a line given two points or slope intercept form of an equation of a line;
  and calculate length of a side using the Pythagorean Theorem.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Data Analysis and Probability Objectives
Students will:

MA.8.5.1 use appropriate technology to solve application problems involving combinations and permutations.

MA.8.5.2 investigate the experimental probability and theoretical probability of an event.

MA.8.5.3 create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.

MA.8.5.4 analyze problem situations, games of chance, and consumer applications using statistical samplings to determine odds and make predictions.

MA.8.5.5 draw inferences and construct convincing arguments, including misuses of statistical or numeric information, based on data analysis.

Performance Descriptors (MA.PD.8.5)

- **Distinguished**
  Eighth grade students performing at distinguished level extrapolate information to make predictions about data samples and calculate probabilities for compound events.
- **Mastery**
  Eighth grade students performing at mastery level solve application problems involving combinations, permutations, games of chance, and statistical samplings. Students, given the results of experiments, calculate the experimental and theoretical probabilities of simple events.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level calculate factorials and theoretical probability of a simple event. Students collect data from a probability experiment.

Algebra/Geometry Preparation Objectives

Algebra/Geometry preparation is an elective course designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Number and Operations (MA.S.1)

Students will:

- demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems;
- demonstrate meanings of operations and how they relate to one another; and
- compute fluently and make reasonable estimates

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra/Geometry Preparation Objectives

Students will:

AGP.1.1 identify and use properties of numbers (commutative, associative, distributive, etc).

AGP.1.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers.

AGP.1.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.2.1 substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems.
AGP.2.2 solve equations with at least two operations.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.3.1 use a compass to construct congruent angles, bisect angles, and bisect line segments.
AGP.3.2 estimate and find circumference and area of a circle.
AGP.3.3 estimate and find the area and perimeter of polygons
AGP.3.4 estimate and find the surface area and the volume of three-dimensional figures.
AGP.3.5 identify angle relationships: complementary, supplementary, vertical, and adjacent.
AGP.3.6 identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles).
AGP.3.7 investigate similar triangles and apply proportions in problem solving situations.
AGP.3.8 develop and explore circle relationships, emphasizing the vocabulary of circles.

Standard 4: Measurement (MA.S.4)
Students will:

- demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurement; and
- apply appropriate techniques, tools and formulas to determine measurements

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.4.1 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units.
AGP.4.2 use a protractor to measure and draw angles.

Standard 5: Data Analysis and Probability (MA.S.5)

Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

AGP.5.1 read, interpret, and construct graphs to solve problems.
AGP.5.2 use data to determine mean, median, mode, and range.
AGP.5.3 find the probability of complementary events and exclusive events.

Algebra I Objectives

Algebra I is a course that provides the gateway to all higher mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem-solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algeblocks, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)

Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra I Objectives

Students will:

AI.2.1 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AI.2.2 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AI.2.3 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AI.2.4 solve literal equations for a given variable and apply the skills toward solving practical problems.
AI.2.5 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AI.2.6 solve absolute value equations in one variable and interpret the results on a number line.
AI.2.7 use the laws of exponents to perform operations on expressions with integral exponents.

AI.2.8	determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AI.2.9	graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AI.2.10	write an equation of a line given a graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AI.2.11	solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AI.2.12	add and subtract polynomials.
AI.2.13	multiply and divide binomials by binomials or monomials.
AI.2.14	factor polynomials by using appropriate methods.
AI.2.15	estimate and simplify square roots into both exact and approximate forms.
AI.2.16	solve quadratic equations by graphing, factoring and quadratic formula.
AI.2.17	add, subtract, multiply and divide simple rational expressions.
AI.2.18	collect, organize, interpret data and predict outcomes using the mean, mode, median, range and standard deviation.
AI.2.19	perform a linear regression and use the results to predict specific values of a variable, and identify the equation for the line of regression.
AI.2.20	predict the outcomes of simple events using the rules of probability.
AI.2.21	use process (flow) charts and histograms, scatter diagrams and normal distribution curves in order to perform statistical process (quality) control.

Applied Mathematics I Objectives

Applied Mathematics I and Applied Mathematics II reflect the content of a complete course in Applied Mathematics. Applied Mathematics I is the first half of the Applied Mathematics course. One Applied Mathematics credit will be given for successful completion of this course. Upon successful completion of both courses, Algebra I credit will be given. Applied Mathematics I is a lab-based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics I Objectives
Students will:

AM1.2.1	solve practical problems involving computation using estimation.
AM1.2.2	write numbers in scientific notation and combine numbers written in scientific notation to solve practical problems.
AM1.2.3	distinguish between counting and measuring using micrometers, calipers and other precision tools to make measurements.
AM1.2.4	solve practical problems and interpret results using rational numbers and vectors.

AM1.2.5 evaluate algebraic expressions using grouping symbols, order of operations and properties of real numbers with justification of steps.
AM1.2.6 translate word phrases into algebraic expressions or word sentences into equations and inequalities.
AM1.2.7 justify steps in the solving of equations based on the properties of real numbers.
AM1.2.8 solve literal equations for a given variable and apply the skills toward solving practical problems.
AM1.2.9 solve practical problems using a four-step problem solving approach.
AM1.2.10 solve multi-step linear equations in one variable and apply skills toward solving practical problems.
AM1.2.11 solve multi-step linear inequalities in one variable, interpret the results on a number line and apply the skills toward solving practical problems.
AM1.2.12 solve absolute value equations in one variable and interpret the results on a number line.
AM1.2.13 collect, organize, interpret data, and predict outcomes using the mean, mode, median, range and standard deviation.
AM1.2.14 estimate and simplify square roots into both exact and approximate forms.
AM1.2.15 use the laws of exponents to perform operations on expressions with integral exponents.
AM1.2.16 predict the outcomes of simple events using the rules of probability.

Applied Mathematics II Objectives

Applied Mathematics II is the second half of the Applied Mathematics course. Upon successful completion of both courses, Algebra I credit will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Applied Mathematics II Objectives
Students will:
AM2.2.1 analyze a given set of data for the existence of a pattern numerically, algebraically and graphically; determine the domain and range; and determine if the relation is a function.
AM2.2.2 determine the slope of a line given an equation of a line, the graph of a line and two points to be identified.
AM2.2.3 graph linear equations using slope-intercept, point slope, and x- and y-intercepts.
AM2.2.4 write an equation of a line given graph of a line, two points on the line, the slope and a point, and the slope and y-intercept.
AM2.2.5 solve systems of linear equations numerically and graphically, by the elimination method and by the substitution method.
AM2.2.6 add and subtract polynomials.
AM2.2.7 multiply and divide binomials by binomials or monomials.

AM2.2.8 factor polynomials by using appropriate methods.
AM2.2.9 solve quadratic equations by graphing, factoring and quadratic formula.
AM2.2.10 add, subtract, multiply and divide simple rational expressions.
AM2.2.11 use process (flow) charts and histograms, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control.
AM2.2.12 perform a linear regression and use the results to predict specific values of a variable. Identify the equation for the line of regression.

Geometry and Applied Geometry Objectives

Geometry is a course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Applied Geometry is a course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of technology as a learning tool. The objectives for Applied Geometry will be the same as those for Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Geometry Objectives
Students will:
G.3.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays and angles.
G.3.2 differentiate between inductive and deductive reasoning.
G.3.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn Diagrams.
G.3.4 construct logical arguments in formal and informal methods with direct and indirect reasoning.
G.3.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles and angles formed by perpendicular lines.

G.3.6 explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism.
G.3.7 investigate and verify congruence relationships in triangles.
G.3.8 explore and identify properties of quadrilaterals and verify the properties for parallelograms, rectangles, rhombuses, squares, and trapezoids.
G.3.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles.
G.3.10 apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios.
G.3.11 using trigonometric ratios, determine lengths of sides and measures of angles in right triangles.
G.3.12 apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships.
G.3.13 investigate measures of angles formed by chords, tangents, and secants of a circle and the relationship to its arcs.
G.3.14 given a polygon, find angle measures of interior and exterior angles; find length of sides from given data; and use properties of regular polygons to find missing data.
G.3.15 develop properties of tessellating figures and use those properties to tessellate the plane.
G.3.16 develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems.
G.3.17 develop concepts of analytical geometry such as formulas for distance, slope, and midpoint and apply these to finding dimensions of polygons on the coordinate plane.
G.3.18 using various methods, construct a triangle's medians, altitudes, angle and perpendicular bisectors; make conjectures and develop mathematical arguments about their relationships.
G.3.19 using transformational geometry, create a reflection, translation, rotation, glide reflection and dilation of a figure; and apply transformations and use symmetry to analyze mathematical situations.
G.3.20 compare and contrast other geometry to Euclidean geometry.
G.3.21 find or approximate the area of irregularly shaped regions.
G.3.22 using the Cartesian coordinate system, find the dimensions of a polygon, given the coordinates of the polygon.

Algebra II Objectives

Listed below are the objectives for Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology will be used as appropriate. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Algebra II Objectives

Students will:

A2.2.1 write equations of lines given various information including parallel and perpendicular lines and vertical and horizontal lines.

A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes.

A2.2.3 define and use i to develop the complex number system; simplify powers and products of i.

A2.2.4 perform basic operations with complex numbers and give answers in simplest form .

A2.2.5 simplify radicals and expressions involving fractional exponents and convert between the two forms .

A2.2.6 solve quadratic equations over the set of complex numbers: apply the techniques of factoring and completing the square and the quadratic formula; use the discriminate to determine the nature of the roots; confirm the solutions numerically and graphically; and apply to practical problems.

A2.2.7 define the components of a matrix: develop and use the appropriate field properties by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.

A2.2.8 solve equations containing radicals and exponents.

A2.2.9 define a function: find the domain, range, zeros; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.

A2.2.10 explore basic families of functions: recognize linear, quadratic, absolute value, step, and exponential functions; and convert among graphs, tables and equations.

A2.2.11 solve quadratic inequalities and graph their solution sets.

A2.2.12 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum and minimum values of a function over a region using linear program techniques

A2.2.13 solve practical problems involving direct, inverse, and joint variation.

A2.2.14 explore the conic sections: recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola; and convert between graphs and equations.

A2.2.15 solve absolute value equations and inequalities graphically, numerically, and algebraically.

A2.2.16 define a logarithmic function: transform equations from exponential form into logarithmic form; and apply the basic properties of logarithms to simplify or expand an expression.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

Conceptual Mathematics Objectives

Conceptual Mathematics is a one-year course for students who have successfully completed the objectives for geometry. This course will include major topics from algebra and geometry and will extend these ideas to practical usage. Basic ideas of probability and statistics and the mathematics of finance will also be included. These, along with other ideas, will be presented in the context of their historical development. Students will be encouraged to be active learners either in cooperative groups or as individuals. It is the purpose of this course to expose students to topics in mathematics that are relevant to any educated person. Full integration of graphing calculators and computer applications such as spreadsheets, database, and Internet use, is essential to effectively master the objectives of this course. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:

- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Conceptual Mathematics Objectives
Students will:

CM.2.1 develop a variety of problem solving strategies (e.g., draw a diagram, look for a pattern, and work backwards).
CM.2.2 interpret graphs of functions (i.e., linear, quadratic, exponential).
CM.2.3 solve application problems using linear, quadratic and exponential functions with emphasis on data collection and analysis.
CM.2.4 use appropriate formulas to solve workplace problems.
CM.2.5 calculate costs, simple and compound interest, finance charges, loan payments and taxes.
CM.2.6 compare various methods of investing money.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.3.1 apply concepts of geometry including the Pythagorean Theorem, similar triangles, and right triangle trigonometry.
CM.3.2 solve workplace problems involving perimeter, area, surface area and volume.
CM.3.3 investigate the applications of various geometric shapes and patterns to art, architecture, and nature.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

CM.5.1 relate mathematical content to its historical development.
CM.5.2 integrate other disciplines into the study of mathematics through simulations, research, and projects
CM.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
CM.5.4 apply the basic probability rules in expressing the chances of events occurring using technology when appropriate.

CM.5.5 create and interpret data using various methods of displaying numerical data, including frequency distributions, graphs, histograms, stem-and-leaf plots, and box-and-whiskers plots, using technology when appropriate.
CM.5.6 relate the measures of central tendency and the measures of dispersion to a normal distribution.
CM.5.7 apply the measures of central tendency and the measures of dispersion to workplace situations.
CM.5.8 use statistical tools for workplace applications such as quality control, marketing and predicting trends.

Trigonometry Objectives

Trigonometry is designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of the trigonometric functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 3: Geometry (MA.S.3)
Students will:
- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Trigonometry Objectives
Students will:
T.3.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions .
T.3.2 find the values of the other trigonometric functions, given the value of one trigonometric function.
T.3.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle.
T.3.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions.
T.3.5 convert angle measures from radians to degrees and vice versa.
T.3.6 verify trigonometric identities by making substitutions and recalling basic identities.
T.3.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain.
T.3.8 find the value of inverse trigonometric functions.
T.3.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula).
T.3.10 express complex numbers in polar form: perform operations including adding, subtracting, multiplying, and dividing; evaluate powers and roots of complex numbers using De Moivre's Theorem; and graph complex numbers.
T.3.11 solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines.

T.3.12 recognize the graph of the six trigonometric functions. Given an equation in the form of y=aSin(bx+c)+d, identify the domain and range; determine the period, phase shift, amplitude and vertical shift; and sketch at least one period of the graph.
T.3.13 model periodic data sets using graphs, tables, and equations.
T.3.14 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included.
T.3.15 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle.
T.3.16 perform mathematical operations with vectors and use vectors to solve practical problems.

Probability and Statistics Objectives

Probability and Statistics is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision-making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in the solution of practical problems. Prerequisites for this course are successful completion of Algebra II and Geometry. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Probability and Statistics Objectives
Students will:
PS.5.1 distinguish between experimental and theoretical probability.
PS.5.2 create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
PS.5.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
PS.5.4 express the chances of events occurring either in terms of a probability or odds.
PS.5.5 use the normal distribution and the binomial distribution including pascal's triangle, to determine probability of events.
PS.5.6 interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
PS.5.7 interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
PS.5.8 describe individual performances in terms of percentiles, z-scores, and t- scores.
PS.5.9 describe the role of sampling, randomness, bias, and sample size in data collection and interpretation.

PS.5.10 explain and illustrate the use and misuse of statistics.
PS.5.11 test the validity of a hypothesis using appropriate statistical concepts.
PS.5.12 determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable.
PS.5.13 calculate the Chi-Square values for a given population.
PS.5.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
PS.5.15 perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
PS.5.16 perform an analysis of variance (ANOVA) and interpret the results.

Pre-calculus Objectives

Pre-calculus is intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 2: Algebra (MA.S.2)
Students will:
- demonstrate understanding of patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships; and
- analyze change in various contexts

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

Pre-calculus Objectives
Students will:
PC.2.1 investigate and sketch the graphs of polynomials and rational functions using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, maximum and minimum points and domain and range.
PC.2.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem.
PC.2.3 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem.
PC.2.4 establish the relationship between exponential and logarithmic functions; graph related functions and include their domain and range.
PC.2.5 solve equations and practical problems involving exponential and logarithmic expressions: include natural and common logarithms; use laws of exponents; and confirm solutions graphically and numerically.
PC.2.6 solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included.
PC.2.7 find the limit of a function, a sequence, or a series by graphing, intuitive reasoning, algebraic methods, and numerical substitution.
PC.2.8 perform mathematical operations with vectors and use vectors to solve practical problems.
PC.2.9 apply the method of mathematical induction to prove formulas and statements.

Standard 3: Geometry (MA.S.3)
Students will:

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations; and
- solve problems using visualization, spatial reasoning, and geometric modeling

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.3.1 graph functions and conic sections using translation.
PC.3.2 investigate properties and solve practical problems of the conic sections.

Standard 5: Data Analysis and Probability (MA.S.5)
Students will:

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on models; and
- apply and demonstrate an understanding of basic concepts of probability

through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.

PC.5.1 perform a regression analysis on a set of data and use the results to predict specific values of a variable. Identify the regression equation.

READING AND ENGLISH LANGUAGE ARTS

The Reading and English Language Arts content standards, objectives and performance descriptors develop in three major strands: 1) reading, 2) writing, 3) listening, speaking and viewing. Each strand provides a clear description of what the student in each grade K-12 should know and be able to do. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a rigorous and challenging program of studies for all students.

References to support the development of the Reading and English Language Arts curriculum include International Reading Association, National Council of Teachers of English, West Virginia Instructional Goals and Objectives, and a multitude of national research. Each reference was reviewed and its relevance was determined in order to produce a solid curriculum for West Virginia students.

Considerations in the development of the Reading and English Language Arts K-12 curriculum included the rigor and challenge that the curriculum would provide students. The curriculum through the grade levels is sequential to allow for foundational content and continues in a spiraling effect in order to ensure a complete mastery of each strand. The Reading and English Language Arts program emphasizes attention to multicultural education, which is particularly evident throughout the reading strand. A crucial component of the curriculum involves use of the language arts across all curriculum disciplines as these skills are essential in comprehending any curricular area.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The three major content standards have defined objectives which explain what the student should know. The examples (e.g.) provided with many of the objectives further clarify skills appropriate to that objective. The examples are not intended to be all inclusive but serve as a guide for the mastery of the objective at the particular grade level. The teacher is strongly encouraged to review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential, spiraling curriculum.

The content standards, objectives and performance descriptors defined herein will serve to ultimately promote a more literate West Virginia society.

Reading and English Language Arts Content Standards K-12

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Kindergarten Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the kindergarten student will be an immersion in a print-rich environment to develop an awareness and understanding of spoken and written language. This awareness will be explored through reading, writing, listening, speaking and viewing which will begin to develop lifelong learning skills. Appropriate literature and language experience, coupled with active student participation, will support this development. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.K.1.1 identify that words are made of phonemes (c/a/t).
RLA.K.1.2 identify the sounds in a one-syllable word (play = p/l/a).
RLA.K.1.3 recognize and manipulate onset and rime (word families).
RLA.K.1.4 use basic elements of phonetic analysis (e.g., common letter/sound relationships; beginning/ending consonant sounds; short/long vowel sounds; word patterns).
RLA.K.1.5 recognize and name all lower/upper case letters in random order.
RLA.K.1.6 identify level-appropriate sight words and vocabulary words (e.g., color words; number words; positional words - top, bottom, in, out; high frequency words - I, it; words for person, places, things and actions).
RLA.K.1.7 recognize basic comprehension concepts (e.g., main idea; setting; characters; sequence; retelling; predicting).
RLA.K.1.8 recognize that print conveys meaning (e.g., know that printed letters and words represent spoken language).
RLA.K.1.9 recognize how print is organized and read (e.g., front of book; title; hold book correctly; follow words from left to right and top to bottom of page; turn pages left to right; one to one match - print and voice; know the difference between words and letters).
RLA.K.1.10 establish a purpose for reading (e.g., for information, for pleasure).
RLA.K.1.11 identify author's purpose (e.g., to persuade, to inform).
RLA.K.1.12 make connections between literary work and people in own life and other cultures (e.g. characters; events).
RLA.K.1.13 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g. environmental print, written directions; signs; captions; labels; technology).
RLA.K.1.14 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.K.2.1 demonstrate knowledge of conventions of print (e.g., correct directionality; proper writing position; print some upper/lower case letters of the alphabet and numerals 0-9; uniformity in print; write own first and/or last name).

RLA.K.2.2 begin to compose written works using appropriate parts of the writing process (e.g., initial attention to planning and drafting; class and individual publishing).

RLA.K.2.3 use writing and other methods for self-expression (e.g., drawing pictures; using letters or phonetically spelled words; telling; dictating; making lists).

RLA.K.2.4 use a variety of sources to gather information in sharing thoughts and ideas (e.g., pictures; charts; videos; television programs; graphs; computers).

RLA.K.2.5 use conventions of spelling in written compositions (e.g., use letter/sound relationships to spell independently; spell some high frequency words appropriate to grade level).

RLA.K.2.6 use conventions of capitalization in written compositions (e.g., first and last names; first word of sentence; pronouns).

RLA.K.2.7 recognize and use conventions of punctuation in written composition (e.g., period and question mark).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.K.3.1 listen, recite, and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns.

RLA.K.3.2 understand the main idea or message in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

First Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts for the first grade student will be an immersion in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The student will grow in language development through reading, writing, listening, speaking and viewing that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction and poetry that reflects cultures, experiences and ideas. The curriculum will encourage and support active participation by the learner. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.1.1.1 blend or segment the phonemes of most one-syllable words.
RLA.1.1.2 substitute, delete and manipulate beginning and ending phonemes.
RLA.1.1.3 develop a rhythm and rhyme of words (e.g., nursery rhymes; songs; poems; tongue twisters).
RLA.1.1.4 use basic elements of phonetic analysis to decode unknown words (e.g., sound relationships; beginning/ending consonants; vowel sounds; blends).
RLA.1.1.5 use basic elements of structural analysis to decode unknown words (e.g., basic prefixes/suffixes; compound words; root words; spelling patterns; contractions).
RLA.1.1.6 understand level appropriate sight words and vocabulary (e.g., high frequency words such as said, was and where; antonyms - hot, cold; synonyms - rock, stone; multiple meaning words - ball).
RLA.1.1.7 use a variety of context clues to determine word meanings (e.g., prior knowledge; reading ahead).
RLA.1.1.8 recognize basic comprehension concepts (e.g., story elements; main idea; sequence; cause/effect; prediction).
RLA.1.1.9 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.
RLA.1.1.10 explain how print is organized and read (e.g., author; illustrator; difference between letters - words - sentences; aware of the use of capitalization and punctuation as text boundaries).
RLA.1.1.11 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; picture captions; title; cover; story structure; story topic; action; events).
RLA.1.1.12 read with accuracy and comprehension instructional level texts designed for the first grade to use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).
RLA.1.1.13 read aloud familiar stories, poems and passages with fluency and expression (e.g., rhythm, flow, meter, tempo, pitch, tone, intonation) and self-select a variety of literary works.
RLA.1.1.14 establish purpose for reading (e.g., for information; for pleasure; to identify a specific viewpoint).
RLA.1.1.15 make connections in literary work and people in own life and other cultures (e.g., events; characters; conflicts).
RLA.1.1.16 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).
RLA.1.1.17 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.1.2.1 use conventions of print (e.g. correct directionality; proper writing position; print upper/lower case letters of the alphabet and numerals; demonstrate uniformity in print; write own first and last name).
RLA.1.2.2 compose written works using appropriate parts of the writing process (e.g. initial attention to planning; drafting; rereading for meaning; some self correction; class and individual publishing).
RLA.1.2.3 develop a simple story with appropriate sequence (e.g. beginning; middle; end).

RLA.1.2.4 write in a variety of forms or genres (e.g. journal writing; written response to literature; writing poems).

RLA.1.2.5 use a variety of sources to gather information to share thoughts and ideas (e.g. informational books; pictures; charts; indexes; videos; television programs; graphs; computers).

RLA.1.2.6 alphabetize to the first letter.

RLA.1.2.7 use conventions of spelling in written composition (e.g. letter/sound relationships; high frequency words from appropriate grade level list; transition from invented spelling to conventional spelling).

RLA.1.2.8 use conventions of capitalization in written composition (e.g. days of week; months of year; names of people; special places; differentiation between common and proper nouns).

RLA.1.2.9 use conventions of punctuation in written composition (e.g. period; question mark; exclamation mark).

RLA.1.2.10 use the mechanics of grammar in written composition (e.g. nouns; verbs; declarative and interrogative sentences).

RLA.1.2.11 use conventions of complete sentences in written composition (e.g. capitalize first word; include a noun and verb; ending punctuation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.1.3.1 identify the main idea of messages in visual media (e.g. pictures; cartoons; weather reports; newspaper photos; visual narratives.)

RLA.1.3.2 listen, recite and respond to familiar stories, poems, nursery rhymes, songs and stories with repeated patterns (e.g. retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Second Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts second grade students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. The student will apply skills of reading, writing, listening, speaking and viewing across the curriculum. Students will be able to read with comprehension to write, speak and listen effectively and to develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers and will begin to make their own choice for recreational and informative reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.2.1.1 use basic elements of phonetic analysis (e.g., syllabication; dipthongs; digraphs; variant vowel sounds such as r-controlled).

RLA.2.1.2 use basic elements of structural analysis to decode unknown words (e.g, syllables; prefixes; suffixes; root words; compound words; spelling patterns; contractions).

RLA.2.1.3 identify and use grade level appropriate sight words and reading vocabulary (e.g., high frequency words; homonyms - I, eye; homophones - read, read; multiple meaning words; synonyms; antonyms).

RLA.2.1.4 use a variety of context clues to decode unknown words (e.g., prior knowledge; read ahead; reread).

RLA.2.1.5 use reading skills and strategies to understand a variety of familiar literary passages and texts (e.g., fairy tales; folk-tales; fiction; nonfiction; poems; legends; fables; fantasies; chapter books).

RLA.2.1.6 use basic comprehension skills to understand a story (e.g., story elements; main idea; sequence; cause/effect; predicting; drawing conclusions; fact or opinion; summarizing; responding creatively to texts).

RLA.2.1.7 respond to both literal and interpretive comprehension questions after reading a short story selection that is developmentally appropriate.

RLA.2.1.8 use meaning clues to aid comprehension and make predictions about content (e.g., pictures; pictures captions; title; cover; heading; story structure; story topic; action; events; character's behavior).

RLA.2.1.9 read with accuracy and comprehension instructional level texts designed for the second grade and use self-correction strategies (e.g., search for cues; identify miscues; reread; ask for help).

RLA.2.1.10 read familiar stories, poems and passages with fluency.

RLA.2.1.11 establish a purpose for reading (e.g., for information; for pleasure; to understand specific viewpoints; to follow directions).

RLA.2.1.12 describe author's purpose (e.g., to persuade, to inform).

RLA.2.1.13 make connections between characters or simple events in a literary work and in own life and other cultures (e.g., events; characters; simple conflicts; themes)

RLA.2.1.14 use reading skills and strategies to understand a variety of informational resources to support literacy learning (e.g., environmental print; written directions; signs; captions; labels; informational books).

RLA.2.2.15 increase amount of independent reading.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.2.2.1 use conventions of print (e.g., maintain proper handwriting position; maintain appropriate position of hand/pencil and paper/desk for the correct transition between manuscript and cursive writing).

RLA.2.2.2 develop a story with proper sequence (e.g., beginning - middle - end containing a main idea and supporting details).

RLA.2.2.3 begin to use the five step writing process (e.g., graphic organizers for pre-writing; descriptive words and details for drafting and revising; use of age appropriate dictionaries for editing and publishing; conferencing to edit: punctuation; capitalization; spelling at developmentally appropriate level).

RLA.2.2.4 use a variety of sources to gather information to communicate with others (e.g., dictionaries; informational book; pictures; charts; indexes; videos; television programs; guest speakers; graphic organizers).

RLA.2.2.5 alphabetize to the second letter and use simple guide words.

RLA.2.2.6 use conventions of spelling in written composition (e.g., spell high frequency words from appropriate grade level list; use letter/sound relationships to spell independently; spell phonetically irregular words - one, could, they; transition from invented to conventional spelling).

RLA.2.2.7 use conventions of capitalization in written composition (e.g., titles; initials; titles of written works; greeting and closing of a letter).

RLA.2.2.8 recognize and use conventions of punctuation in written composition: period (e.g., abbreviations, initials); comma (e.g., dates, greeting/closing of a letter, separate city - state - country, separate items in a list); quotation marks for direct quotes; apostrophe (e.g., contractions, singular possessives).

RLA.2.2.9 use the mechanics of grammar in written composition (e.g., correct subject/verb agreement; simple adjectives and adverbs).

RLA.2.2.10 write correctly formed and punctuated simple sentences (e.g., declarative; interrogative; exclamation).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.2.3.1 recognize the main idea or intended messages in visual media (e.g., pictures; cartoons; weather reports; newspaper photos; visual narratives).

RLA.2.3.2 listen, recite and respond to familiar stories, poems and songs (e.g., retell in sequence; relate information to own life; describe character - setting - plot; engage in creative and dramatic play; imagine beyond the story).

Third Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts third grade students will learn, practice and apply strategies focusing on preparing literate, independent and self-motivated learners. Students will be engaged in reading and responding to a variety of literature using literal and critical comprehension skills. These learners will develop and, as critical thinkers, take responsibility for their own learning. The student will interact with and respond to text in purposeful situations across the curriculum. Proficiency in reading, writing, listening, speaking and viewing will foster an appreciation for literature and will allow students to make connections between their personal experiences and academic disciplines. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.3.1.1 recognize level appropriate sight words and content vocabulary.

RLA.3.1.2 recognize level appropriate reading vocabulary (e.g. synonyms, antonyms, homonyms, multi-meaning words).

RLA.3.1.3 use reading skills and strategies to comprehend a variety of literary passages and texts (e.g. fairy tales, folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; historical fiction; biographies; autobiographies; chapter books).

RLA.3.1.4 use comprehension skills to understand a story (e.g. story elements; sequence; expository works; drawing conclusions; compare/contrast; predict; summarize; infer; paraphrase; main idea; story topic).

RLA.3.1.5 recognize the ways in which language is used in literary text (e.g. simile; metaphor; idioms).

RLA.3.1.6 use graphic organizers and visualization techniques to interpret information (e.g. charts; graphs; diagrams).

RLA.3.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g. action; events; story topic; behaviors).

RLA.3.1.8 read with accuracy and comprehension instructional level texts designed for third grade and use self-correction strategies (e.g. search for cues; identify miscues; reread).

RLA.3.1.9 read familiar stories, poems and passages with fluency and expression (e.g. rhythm; flow; meter; tempo; pitch; tone; intonation) and self-select a variety of literary works.

RLA.3.1.10 explain a purpose for reading (e.g. for information; for pleasure; to understand a specific viewpoint).

RLA.3.1.11 recognize author's purpose (e.g. to persuade; to inform).

RLA.3.1.12 compare connections between characters or simple events in a literary work in own life and other cultures (e.g. events; characters; conflicts; themes).

RLA.3.1.13 use reading skills and strategies to identify a variety of informational resources to support literacy learning (e.g. environmental print; written directions; signs; captions; labels; informational books).

RLA.3.1.14 increase amount of independent reading.

Performance Descriptors (RLA.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level read independently above grade level passages/texts to establish a purpose for reading, identify author's purpose, compare connections between characters or simple events in a literary work and use reading skills and strategies to identify a variety of informational resources to support literacy learning.
- **Mastery**
  Third grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify story elements, sequence, expository works, draw conclusions, compare/contrast, predict, summarize, make inferences, paraphrase and recognize author's purpose.
- **Partial Mastery**
  Third grade students performing at the partial mastery level read grade level passages/texts using basic comprehension skills to interpret a story. Students use meaning clues to aid comprehension and make predictions about content; apply self-correction strategies such as searching for cues, identifying miscues, reread, self-question and asking for help.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.3.2.1 demonstrate proper manuscript and full transition to cursive writing techniques (e.g., posture; paper placement; pencil grip; letter formation; slant; letter size; spacing; rhythm; alignment).

RLA.3.2.2 use the five step writing process (e.g., graphic organizers for prewriting; descriptive words and details for drafting and revising; use of simple dictionaries for editing and publishing; conferencing to edit; punctuation; capitalization; and spelling at developmentally appropriate level).

RLA.3.2.3 use paragraph format to write compositions (e.g., beginning - middle - end; main ideas with relevant details; sentence variety - declarative, interrogative; descriptive and transitional words; indentations).

RLA.3.2.4 use a variety of strategies to plan simple research (e.g., identify possible topic by brainstorming; list questions; use idea webs; organize prior knowledge about a topic; develop a course of action for writing; determine how to locate necessary information).

RLA.3.2.5 use a variety of sources to gather information (e.g., use dictionaries; encyclopedias; newspapers).

RLA.3.2.6 alphabetize to the third letter and use simple dictionary skills (e.g., guide words, pronunciation).

RLA.3.2.7 use conventions of spelling in written composition (e.g., spell high frequency words form appropriate grade level list; use letter/sound relationships to spell independently; make structural changes to spell words correctly: spell irregular verbs and irregular plural nouns).

RLA.3.2.8 use conventions of capitalization in written composition (e.g., greeting - heading - closing of a letter; first word of a direct quotation).

RLA.3.2.9 use conventions of punctuation in written composition (e.g., commas in dates and addresses; greeting/closing of a letter; quotation marks around titles and direct quotations; apostrophes for contractions and possessive nouns).

RLA.3.2.10 write a grammatically correct sentence (e.g., correct subject/verb agreement with singular and plural nouns and verbs; correct use of regular and irregular verbs).

RLA.3.2.11 use specific mechanics of grammar in written composition (e.g., substitute pronouns for nouns; use pronoun agreements; adjectives; adverbs).

RLA.3.2.12 write correctly formed sentences avoiding run-on sentences.

Performance Descriptors (RLA.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level write a descriptive composition that details a beginning, middle and ending using advanced language mechanics and grammar, such as a variety of sentence structure, punctuation and capitalization.
- **Mastery**
  Third grade students performing at the mastery level write a descriptive paragraph consisting of a beginning, middle and end using language mechanics and grammar at grade level.
- **Partial Mastery**
  Third grade students performing at the partial mastery level write a three simple sentence paragraph consisting of a beginning, middle and end using beginning capitalization, ending punctuation and subject-verb agreement.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.3.3.1 listen and respond to familiar stories and poems (e.g., summarize and paraphrase to confirm comprehension; recount personal experiences; imagine beyond the literary form).

RLA.3.3.2 define different messages conveyed through visual media (e.g., main ideas and supporting details; facts and opinions; main characters; setting; sequence of events).

Performance Descriptors (RLA.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level listen and respond to stories and poems to paraphrase and experience beyond the literary form. Students analyze the characters, setting and plot to determine the message through visual media.
- **Mastery**
  Third grade students performing at the mastery level listen and respond to familiar stories and poems to summarize and recount personal experiences. Students determine messages through visual media to identify main idea and supporting details, fact and opinion and sequence of events.
- **Partial Mastery**
  Third grade students performing at the partial mastery level listen, recite and respond to familiar stories and poems to retell the story in sequence and relate text to self. Students recognize the main idea or messages in visual media.

Fourth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fourth grade students will develop as readers and writers who are independent, self-motivated and critical thinkers and take responsibility for their own learning. Students will learn to critically evaluate what they read; to express themselves clearly in speaking and writing; to gather and use information through a variety of sources; and to use listening as a reading strategy. Each of these strategies is to be applied in the content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, building the foundation for lifelong reading. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.4.1.1 identify level appropriate vocabulary (e.g., multiple meaning words; synonyms; antonyms; homonyms; content area vocabulary; context clues).

RLA.4.1.2 apply structural analysis and context clues to decode and encode words.

RLA.4.1.3 recognize the defining characteristics of a variety of literary forms and genres (e.g., fairy tales; folk-tales; fiction; nonfiction; myths; poems; fables; fantasies; biographies; autobiographies; chapter books).

RLA.4.1.4 use comprehension skills to understand literary works (e.g., summarize; story elements; skim and scan; define expository text; compare/contrast; imagery; paraphrase; compose personal response; infer; fact and opinion; sequence).

RLA.4.1.5 recognize the ways in which language is used in literary texts (e.g., simile; metaphor; idioms; analogies; and puns).

RLA.4.1.6 use graphic organizers and visualization techniques to interpret information (e.g., charts; graphs; diagrams; non-verbal symbols).

RLA.4.1.7 use meaning clues to aid comprehension and make predictions about content across the curriculum (e.g., pictures; picture captions; titles; headings; story structure; story topic; action - events - character behaviors).

RLA.4.1.8 read with accuracy and comprehension instructional level texts designed for the fourth grade and use self-correction strategies (e.g., search for cues; identify miscues; reread).

RLA.4.1.9 read orally and silently literary texts across the curriculum with fluent expression.

RLA.4.1.10 determine a purpose for reading across the curriculum.

RLA.4.1.11 summarize the author's purpose (e.g., to persuade; to inform; to determine a specific viewpoint).

RLA.4.1.12 compare self to text in making connections between characters or simple events in a literary work with people and events in one's own and other cultures.

RLA.4.1.13 increase amount of independent reading.

Performance Descriptors (RLA.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level read independently above grade level passages/texts to explain the purpose for reading, identify figurative language, employ meaning clues to aid comprehension and predict content across the curriculum.
- **Mastery**
  Fourth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to scan and skim, identify imagery, compose a response and distinguish fact/opinion.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level read grade level passages/texts to compare self to text and apply pre-reading strategies such as accessing prior knowledge, previewing and setting a purpose.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.4.2.1 use conventions of print (e.g., legibility; uniformity in all written work).

RLA.4.2.2 use the five step writing process (e.g., focused composition; coherent and logical progression of ideas; correct page format - title - paragraphs - margins - indentations).

RLA.4.2.3 use proper paragraph form in written composition (e.g., indent the first word of a paragraph; use topic sentence; recognize a paragraph as a group of sentences about one main idea; use an introductory and concluding paragraph; write at least two related paragraphs).

RLA.4.2.4 use strategies to gather and record information for research topics (e.g., notes- maps - charts - graphs - tables; summarize - paraphrase - describe in narrative form; gather direct quotes).

RLA.4.2.5 use reference skills to identify words (e.g., alphabetical order, guide words, pronunciation, glossary).

RLA.4.2.6 use strategies to compile information into written reports or summaries (e.g., incorporate notes into a finished product; include simple facts - details - explanations - examples; draw conclusions from relationships and patterns that emerge from data of different sources; use appropriate visual aids and media).

RLA.4.2.7 use conventions of spelling in written composition (e.g., spell high frequency words; spell commonly misspelled words from appropriate grade level list; use dictionary and other resources to spell words; use syllable constructions to spell words; use vowel combinations for correct spelling; use contractions - compound words - roots - suffixes - prefixes in spelling).

RLA.4.2.8 use conventions of capitalization in written composition (e.g., titles of people; proper nouns such as towns - cities - counties - countries - names of streets - holidays; first word of a direct quote; heading - salutation - closing of a letter).

RLA.4.2.9 use conventions of punctuation in written composition (e.g., use colons in business letter salutations; use quotation marks in the title of poems - songs - chapters; underline book titles).

RLA.4.2.10 use a variety of sentence structure correctly in writing (e.g., simple - compound - complex sentences; avoid sentence run-ons and fragments).

RLA.4.2.11 use the mechanics of grammar in written composition (e.g., avoid double negatives; correct verb tenses; use conjunctions - interjections - prepositions; correct subject verb agreement with regular and irregular verbs).

Performance Descriptors (RLA.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level write a multiple paragraph composition that displays a focused, coherent and logical progression of ideas; and considers page format, titles, margins and indentations. Students apply advanced language mechanics and grammar such as the rules of capitalization, punctuation and compound complex-sentences.
- **Mastery**
  Fourth grade students performing at the mastery level develop and write a multiple paragraph composition using language mechanics and grammar at grade level.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level write a paragraph with a topic sentence, supporting sentences and a concluding sentence.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.4.3.1 listen and respond to different literary forms (e.g., summarize and paraphrase to confirm understanding; recount personal experiences; listen to information and exhibit comprehension; provide reasons in support of opinions; respond to others' ideas).

RLA.4.3.2 define a variety of messages conveyed through visual media (e.g., provide information by observing main concept - details - themes or lessons - viewpoints; recognize intended audience).

Performance Descriptors (RLA.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level recognize oral communication and listening skills to relate ideas and details. Students listen and view in order to understand themes or lessons while recognizing the intended audience.
- **Mastery**
  Fourth grade students performing at the mastery level listen and respond to different literary forms to paraphrase, give reasons in support of opinions and respond to other ideas. Students recognize viewpoints and audiences through visual media and provide oral examples.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level listen and respond to familiar stories and poems to relate personal experiences and summarize details. Students recognize the story elements of visual media.

Fifth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts fifth grade students will expand and strengthen knowledge and abilities learned in earlier grades. Listening, speaking and viewing instruction will prepare students for interaction and expression at school, home, and later, in the work place. Reading comprehension and vocabulary skills will enable students to read at literal, interpretive and critical levels for functional and recreational purposes. The earlier development of the writing process will be strengthened and expanded within and across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.5.1.1	identify defining characteristics, build background knowledge and develop reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myth; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.5.1.2	increase amount of independent reading.
RLA.5.1.3	determine main idea and locate supporting details in a literary passage and across the curriculum.
RLA.5.1.4	analyze text to determine time and sequence.
RLA.5.1.5	use comprehension skills (e.g., draw conclusions; predict; use context clues; summarize).
RLA.5.1.6	determine the elements of literature (e.g., characterization; conflict; plot) to construct meaning and recognize author's and/or reader's purpose.
RLA.5.1.7	identify figurative language in text (e.g., hyperbole; alliteration).
RLA.5.1.8	make text connections to self, to other text and to the world.
RLA.5.1.9	identify literary techniques used to interpret literature (e.g., compare/contrast; cause/effect).
RLA.5.1.10	ead types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quatrain).
RLA.5.1.11	use resource materials (e.g., dictionary; glossary) to determine the meaning of unknown words or multiple meaning words.
RLA.5.1.12	use denotation to understand meaning.
RLA.5.1.13	use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.5.1.14	spell commonly misspelled and easily confused words from appropriate grade level list.

Performance Descriptors (RLA.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level read independently above grade level passages/texts across the curriculum to apply higher order thinking skills such as analyze text, determine elements of literature to construct meaning, draw and justify conclusions, generalize and make judgments.
- **Mastery**
  Fifth grade students performing at the mastery level read independently grade level literary texts using comprehension skills to identify, interpret and evaluate (point of view, conflict, characterization) and to recognize figurative language.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level read grade level passages/texts to connect self to text and identify critical thinking skills such as rephrasing and responding to what is read. Students identify the defining characteristics and use reading strategies to understand informational texts.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:
- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.5.2.1	use pre-writing and drafting strategies to generate topics and plan approaches to writing tasks.
RLA.5.2.2	use the writing process to develop a composition that contains specific, relevant details.
RLA.5.2.3	use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.5.2.4	use strategies to write for a specific purpose (e.g., creative; narrative; informative; persuasive).
RLA.5.2.5	use strategies to address specific types of writing (e.g., journal; friendly letter; business letter).
RLA.5.2.6	develop a 3-5 paragraph composition with an introductory paragraph, supporting details paragraph(s) and concluding paragraph.
RLA.5.2.7	use a variety of sentence types (e.g., simple; compound; declarative; exclamatory; imperative; interrogative) avoiding run-on sentences and sentence fragments.
RLA.5.2.8	apply capitalization rules (e.g., abbreviations; titles of people; initials).
RLA.5.2.9	apply punctuation rules (e.g., commas; apostrophes; colons; semicolons; quotation marks).
RLA.5.2.10	write and punctuate simple and compound sentences using conjunctions, interjections and prepositions correctly.
RLA.5.2.11	identify correct pronoun case and pronoun/antecedent agreement.
RLA.5.2.12	identify action, helping and linking verbs while using correct verb tense and subject/verb agreement.
RLA.5.2.13	identify adjectives and adverbs in their comparative and superlative forms.
RLA.5.2.14	organize information by correctly combining subjects, predicates, modifiers and phrases in sentences.
RLA.5.2.15	identify the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.5.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms).
RLA.5.2.17	use card catalog, either hard copy or computer database, to locate sources for research/report topics by title, author and/or subject.
RLA.5.2.18	identify and interpret graphic aids (e.g., maps; charts; graphs; tables; timelines).

Performance Descriptors (RLA.PD.5.2)
- **Distinguished**
  Fifth grade students performing at the distinguished level write multiple paragraph compositions for self-selected purposes to include creative, narrative, and informative topics. Students will apply advanced language mechanics and grammar such as complex sentence structure and vivid transitional words.
- **Mastery**
  Fifth grade students performing at the mastery level write multiple paragraph compositions for specific purposes. These include creative, narrative and informative compositions using language mechanics and grammar at grade level.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level write multiple paragraphs to a specific prompt for a composition. Students apply language mechanics and grammar such as punctuation and capitalization rules and organize information by utilizing compound subjects, predicates, modifiers and phrases.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.5.3.1 recognize and exhibit oral communication skills (e.g., rate, audience etiquette).
RLA.5.3.2 identify and correct usage errors in oral communication (e.g., word choice; grammar - I have seen, not I have saw).
RLA.5.3.3 deliver recitations.
RLA.5.3.4 relate personal experiences to oral/visual information.
RLA.5.3.5 listen in order to understand a topic (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.5.3.6 contribute to group discussions by exhibiting active listening skills.

Performance Descriptors (RLA.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level deliver an oral presentation across the curriculum through reports, recitations, dramatization and sequential story retelling. Students exhibit oral communication skills by pitch, tone and rate.
- **Mastery**
  Fifth grade students performing at the mastery level recognize and exhibit oral communication skills and enhance listening comprehension skills by taking notes, organizing and summarizing spoken ideas and details. Students listen in order to understand a topic, purpose and perspective in spoken text.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize oral communication and listening skills to classify ideas and details. Students listen in order to determine details and story elements in spoken texts.

Sixth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts sixth grade students will continue mastery of communication skills. At this level listening, speaking and viewing strategies require students to gather and process oral information and to effectively express themselves in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to developing writing skills that are error-free and demonstrate mastery in mechanics and usage to communicate ideas effectively. The student will utilize these competencies across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.6.1.1 know the defining characteristics, build background knowledge and use reading skills to understand a variety of West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).
RLA.6.1.2 increase amount of independent reading.
RLA.6.1.3 determine theme and locate supporting details in a literary passage and across the curriculum.
RLA.6.1.4 analyze text to determine transitional words/language.
RLA.6.1.5 use comprehension skills (e.g., draw conclusions; interpret meaning).
RLA.6.1.6 determine the elements of literature (e.g. external conflict; mood) to construct meaning and recognize author's and/or reader's purpose.
RLA.6.1.7 identify figurative language in text (e.g., simile; metaphor; personification).
RLA.6.1.8 explain text connections to self, to other text and to the world for understanding a literary passage.
RLA.6.1.9 identify and classify types of poetry that use inversion, rhyme and rhythm (e.g., diamante; shape; haiku; limerick; name poems; bio poems; cinquain; and quantrain).
RLA.6.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.6.1.11 use connotation and denotation to understand meaning.
RLA.6.1.12 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.
RLA.6.1.13 spell commonly misspelled words, easily confused words and words with irregular endings across the curriculum.

Performance Descriptors (RLA.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students identify and classify literary types, draw and justify conclusions and opinions, explain inferences and interpret author's purpose.
- **Mastery**
  Sixth grade students performing at the mastery level read independently grade level literary types, draw and justify conclusions and summarize grade level passage.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level read grade level materials to recognize literary types, draw conclusions and develop a simple summary.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.6.2.1	use pre-writing and drafting strategies (e.g., drawing; clustering; brainstorming; discussion) to generate topics and plan approaches to writing tasks.
RLA.6.2.2	from a prompt, use the writing process to develop a composition that contains specific, relevant details and transitions.
RLA.6.2.3	use writing strategies to address specific writing purposes (e.g., creative; journalistic; essay; narrative; informative; persuasive) and address various audiences (e.g., peers; teachers; employers).
RLA.6.2.4	edit own writing as well as the writing of others to correct errors in organization, content, usage, mechanics and spelling.
RLA.6.2.5	demonstrate mastery of a 3-5 paragraph composition.
RLA.6.2.6	apply capitalization rules (e.g., proper adjectives; names of written works; family relationships; nationalities; religions/religious terms).
RLA.6.2.7	apply punctuation rules (e.g., commas; apostrophes in contractions and possessives both singular and plural; colons; semicolons; quotation marks; hyphens).
RLA.6.2.8	write and punctuate simple and compound sentences with conjunctions, interjections and prepositions.
RLA.6.2.9	identify and use correct pronoun case.
RLA.6.2.10	identify action, helping and linking verbs while correctly using verb tense and subject/verb agreement in simple and compound sentences.
RLA.6.2.11	use adjectives and adverbs in comparative and superlative forms.
RLA.6.2.12	compose sentences that contain compound subjects and compound verbs.
RLA.6.2.13	organize information by combining predicates, modifiers, phrases and/or clauses and sentences.
RLA.6.2.14	identify and correct run-on sentences, sentence fragments and redundant words/sentences.
RLA.6.2.15	use the parts of a book, know their purposes and locate information (e.g., table of contents; index; glossary).
RLA.6.2.16	identify and use traditional reference sources for different types of information (e.g., dictionary; thesaurus; atlas; almanac, encyclopedia; newspaper; telephone directory; recipes; menus; schedules; advertisements; order forms; audiovisual resources).
RLA.6.2.17	begin to demonstrate the ability to identify the source, location, media type, relevancy and content validity of available resource information.
RLA.6.2.18	identify title, author, subject, call number, publisher and copyright of resources using the card catalog, either hard copy or computer database.
RLA.6.2.19	use traditional organizers to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts.
RLA.6.2.20	organize information into an outline by being able to categorize information into topic, subtopic and detail.
RLA.6.2.21	identify and use correct note taking skills.

Performance Descriptors (RLA.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level write an effective and elaborate multiple paragraph composition correct in form and language. Students independently construct and organize research notes from print and non-print sources.
- **Mastery**
  Sixth grade students performing at the mastery level write a three to five paragraph composition employing grade level grammatical/mechanical conventions. Students apply note-taking skills to organize research data into an outline or graphic representation.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level write a basic composition with a beginning, middle and end demonstrating grade level command of grammatical and mechanical conventions. Students use fundamental note-taking skills to organize information into a basic format.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.6.3.1 recognize and exhibit oral communication skills (e.g. volume; rate; audience etiquette).
RLA.6.3.2 retell simple and detailed stories sequentially.
RLA.6.3.3 listen in order to comprehend topic and purpose (e.g. of a guest speaker; informational video; televised interview; radio news program).
RLA.6.3.4 reach consensus in group discussions or settings.

Performance Descriptors (RLA.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes, commanding audience attention. Students' fluent oral reading exhibits accurate pitch, tone, rate and volume.
- **Mastery**
  Sixth grade students performing at the mastery level communicate with a peer audience for different purposes. Students demonstrate receptive audience behavior and identify components of presentations. Students read orally exhibiting elements of pitch, tone, rate and volume.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level communicate in small group situations. Students demonstrate receptive audience behavior. Students read orally in small groups.

Seventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts seventh grade students will continue to build, expand and refine prior learning. Instruction in rigorous listening, speaking and viewing skills will assist in preparing students to interact and express themselves among peers, at home and in the community. Reading comprehension and vocabulary will develop through the use of a wide variety of literary genres and strategies. Writing will utilize error-free and content-rich communication in gathering, organizing, interpreting and reporting information gained through reading. The student will be exposed to these objectives not only in the language arts but across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.7.1.1 classify the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.7.1.2 increase amount of independent reading.

RLA.7.1.3 relate common themes across a variety of literature.

RLA.7.1.4 use comprehension strategies (e.g., generalize; evaluate; infer; paraphrase).

RLA.7.1.5 determine the elements of literature (e.g., internal conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.7.1.6 identify figurative language in text (e.g., jargon; idioms).

RLA.7.1.7 make text connections to self, to other text and to the real world.

RLA.7.1.8 identify literary techniques used to interpret literature (e.g., flashback; stereotype; foreshadowing; propaganda).

RLA.7.1.9 read types of poetry and the use of inversion, rhyme and rhythm in narrative poems, ballads and lyrics.

RLA.7.1.10 recognize and understand clipped or shortened words and their meaning. (e.g., bio for biography; auto for automobile).

RLA.7.1.11 compare/contrast connotation and denotation to understand and enhance meaning of words, sentences and passages.

RLA.7.1.12 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.

RLA.7.1.13 use root words, prefixes and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level read both functional and recreational materials above grade level. Students classify literary types, support inferences and paraphrase selections making connections to other texts and global situations.
- **Mastery**
  Seventh grade students performing at the mastery level read independently grade level materials to classify literary types, explain inferences and paraphrase long selections.
- **Partial Mastery**
  Seventh grade students performing a the partial mastery level read grade level materials to recognize literary types. Students use simple summarizing and paraphrasing in a simple passage.

Standard 2: Writing (RLA.S.2)

Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives

Students will:

RLA.7.2.1 from a prompt, use the writing process to develop a focused composition that contains specific, relevant details and transition.

RLA.7.2.2 use editing and revision techniques to vary sentence length, change sentence order, use vivid and concise words and eliminate organizational errors.

RLA.7.2.3 use the writing process to compose various types of writing (e.g., creative; informative; expository; persuasive; articles; essays; journals; letters; poetry; research/reports).

RLA.7.2.4 apply capitalization rules (e.g., languages; school subjects; regions of the U.S.; dialogue; lines of poetry).
RLA.7.2.5 apply punctuation rules (e.g., commas; apostrophes in possessives and contractions; colons; semicolons; hyphens; dashes; parentheses).
RLA.7.2.6 use pronouns, pronoun cases and antecedents in correct form.
RLA.7.2.7 use and apply correct forms of adjectives and adverbs and/or complex sentence.
RLA.7.2.8 recognize and avoid use of double negatives.
RLA.7.2.9 compose and punctuate simple, compound and complex sentences with and without conjunctions.
RLA.7.2.10 organize information by combining subjects, predicates, modifiers and appositives in a sentence.
RLA.7.2.11 use correct verb tense and subject verb agreement (e.g., irregular verbs; compound subjects; indefinite pronouns; intervening phrases).
RLA.7.2.12 edit to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.7.2.13 use title page, copyright page, table of contents, appendix, bibliography, glossary and index to locate specified information.
RLA.7.2.14 identify and use traditional reference sources for different types of information (e.g., *Reader's Guide; Books In Print;* newspapers; schedules; advertisements; audiovisual resources).
RLA.7.2.15 recognize copyright laws/issues, ethical acquisition and use of digital information in citing sources for research/report.
RLA.7.2.16 identify the source, location, media type, relevancy and content validity of available information.
RLA.7.2.17 demonstrate the ability to use the card catalog in hard copy or database to identify title, author, subject, call number, publisher and copyright resources.
RLA.7.2.18 develop an outline using prepared notes to write a paragraph.

Performance Descriptors (RLA.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level write an elaborate composition from a prompt that is well-crafted, cohesively organized and employs sophisticated transitional elements. Students construct a detailed outline to produce a research-based report.
- **Mastery**
  Seventh grade students performing at the mastery level write a focused composition from a prompt with grade level grammatical/mechanical conventions; sentence variety, supporting details and clear transition. Students develop an outline from research notes to produce a paragraph.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level write a composition form a prompt with limited grammatical/mechanical conventions; complete sentences, basic details and evidence of transition. Students produce a simple outline from notes.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.7.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; audience etiquette).
RLA.7.3.2 perform dramatizations.
RLA.7.3.3 use oral/visual information to foster exploration, questioning and imagining of a topic.
RLA.7.3.4 listen in order to comprehend topic, purpose and perspective in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).
RLA.7.3.5 play a variety of roles in group discussions including active listener and discussion leader.
RLA.7.3.6 distinguish between private and public information in research and reporting.

Performance Descriptors (RLA.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level communicate effectively with a variety of audiences for different purposes. Students deliver an expressive oral presentation exhibiting effective communication skills. Students respond critically to oral and visual information to oral and visual information by exploring and questioning the topic.
- **Mastery**
  Seventh grade students performing at the mastery level communicate with an audience for different purposes. Students deliver an oral presentation exhibiting communication skills by using a prepared script. Students respond to oral and visual information by exploring and questioning the topic.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level communicate with a small group for a specific purpose. Students deliver an oral presentation by reading from a prepared script. Students respond to oral and visual information by summarizing the topic.

Eighth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eighth grade students will develop strategies that support understanding language in real life situations. Writing will focus on audience, stressing mechanics, language expression and organization of ideas. Reading comprehension and vocabulary will stress development of reading and thinking skills that enable students to comprehend and react critically to various genres of regional, national and international works. The student will utilize language arts skills across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.8.1.1 analyze the defining characteristics, build background knowledge and apply reading skills to understand a variety of literary passages and texts by West Virginia, national and international authors (e.g., fiction; nonfiction; myths; poems; fantasies; biographies; autobiographies; science fiction; tall tales; supernatural tales).

RLA.8.1.2 relate literary theme to global situations.

RLA.8.1.3 use comprehension strategies (e.g., make judgments; hypothesize; critique; analyze).

RLA.8.1.4 determine the elements of literature (e.g., internal/external conflict; point of view) to construct meaning and recognize author's and/or reader's purpose.

RLA.8.1.5 identify figurative language in text (e.g., onomatopoeia; pun).

RLA.8.1.6 make text connections to self, to other text and to the real world.

RLA.8.1.7 identify literary technique used to interpret literature (e.g., irony; satire; persuasive language; analogies).

RLA.8.1.8 read and identify types of poetry and the use of inversion, rhyme and rhythm (e.g., narrative poem; ballad; lyric; epic).
RLA.8.1.9 recognize and understand acronyms.
RLA.8.1.10 use resource materials (e.g., dictionary; glossary; thesaurus) to determine the meaning of unknown words or multiple meaning words.
RLA.8.1.11 use root words, prefixes, and suffixes to spell words, change word meanings and generate new words appropriate to grade level.

Performance Descriptors (RLA.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level read both functional and recreational materials above grade level. Students extend multiple text information by making and supporting judgments, hypothesizing, critiquing and analyzing abstract themes.
- **Mastery**
  Eighth grade students performing at the mastery level read independently and analyze grade level literary genres, make and support judgments and hypothesize to connect reader's response with author's purpose.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level read grade level materials to classify literary types, explain inferences and make judgments, demonstrate literal knowledge of text and relate text to personal experience.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.8.2.1 use the writing process to demonstrate the ability to compose a variety of written work (e.g., creative; informative; expository; persuasive; chronological explanatory; compare/contrast; cause/effect; article; essay; journal; letters; reports; poetry).
RLA.8.2.2 from a prompt, develop a focused composition that contains specific, relevant details, smooth transition and vivid, precise words.
RLA.8.2.3 use revision and editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling.
RLA.8.2.4 recognize and write a simple thesis statement.
RLA.8.2.5 apply all capitalization rules in writing.
RLA.8.2.6 apply punctuation rules in writing (e.g., appositives; phrases; clauses).
RLA.8.2.7 compose and punctuate grammatically correct simple, compound and complex sentences.
RLA.8.2.8 identify and correct faulty parallel sentence structure such as phrases and clauses.
RLA.8.2.9 edit and revise to eliminate run-on sentences, sentence fragments, redundant words/sentences and misplaced modifiers.
RLA.8.2.10 conduct research using parts of a book to gather, evaluate and synthesize data from a variety of sources (e.g., print; non-print; people).
RLA.8.2.11 identify and use traditional reference sources for different types of information.
RLA.8.2.12 independently resolve information conflicts and validate information through assessing, researching and comparing data.
RLA.8.2.13 demonstrate the ability to identify the source, location, media type, relevancy and content validity of available information.
RLA.8.2.14 apply use of card catalog and/or computer databases to identify title, author, subject, call number, publisher and copyright resources to gather information for a presentation.
RLA.8.2.15 use an outline to develop a written and/or oral presentation using graphic representation.

Performance Descriptors (RLA.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level write an elaborate composition with a concise thesis statement demonstrating command of grammatical/mechanical conventions, vivid word terminology and sophisticated transitional elements to enhance meaning. Students integrate relevant, valid information in a research-based presentation.
- **Mastery**
  Eighth grade students performing at the mastery level write a composition including a thesis statement designed for a specific audience. Students apply grade level grammatical/mechanical conventions, correct word terminology and smooth transition. Students identify information that is relevant and valid for a research-based presentation.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level write a composition with evidence of grammatical/mechanical conventions, correct word terminology, transition and use of relevant information in a simple research-based presentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.8.3.1 recognize and exhibit oral communication skills (e.g., tone; volume; rate; speaking etiquette; audience etiquette).

RLA.8.3.2 present an oral report with graphic aids (e.g., tables; graphs; diagrams; charts).

RLA.8.3.3 think critically about oral/visual information presented; relate personal experiences and apply the information to global situations.

RLA.8.3.4 listen in order to analyze and critique information received in spoken texts (e.g., of a guest speaker; informational video; televised interview; radio news program).

RLA.8.3.5 play a variety of roles in group discussions including active listener, discussion leader and/or facilitator.

RLA.8.3.6 properly use private and public information.

Performance Descriptors (RLA.PD.8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level plan, design and deliver an enhanced oral/visual presentation justifying their opinions on global situations. Students evaluate sources and the use of public/private information, and apply communication skills required for various careers.
- **Mastery**
  Eighth grade students performing at the mastery level plan, design and deliver an effective oral presentation. Students relate personal experiences to oral/visual information, distinguish between public and private information and identify communication skills required for various careers.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level deliver oral presentations, communicate personal experiences, locate information and investigate communication skills required for various careers.

Ninth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts ninth grade students will focus on the effective use of written language in educational and occupational endeavors and interpersonal communications. Instructional delivery will be enhanced through a wide range of media. Frequent interaction with a broad array of quality literature will encourage an appreciation for the power of the written and spoken word. All language arts skills and strategies will be utilized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.9.1.1 identify historical, cultural and biographical influences of literary works.
RLA.9.1.2 recognize literary styles according to genre.
RLA.9.1.3 increase the amount of independent reading with emphasis on fiction and nonfiction.
RLA.9.1.4 develop various reading skills for literary experience, information and/or performing a task (e.g., skimming; scanning; note taking; SQ3R).
RLA.9.1.5 locate specific information in text (e.g., main and supporting ideas; specific facts; statistics; definition).
RLA.9.1.6 expand the use of various strategies to establish word meanings (e.g., context clues; affixes; multiple meanings).
RLA.9.1.7 recognize and explain the function of illustration within a specific text (e.g., pictures; artwork; graphic organizers such as maps - charts - lists - graphs).
RLA.9.1.8 recognize literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.9.1.9 identify literary elements within specific genre (e.g., point of view; theme; conflict; characterization; voice).
RLA.9.1.10 recognize the elements, structures and tone of various genres (e.g., novels; short stories; poetry; drama).

Performance Descriptors (RLA.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level read, analyze and evaluate advanced level texts to draw supportable conclusions about historical, cultural and biographical influences on literary works. Students analyze and evaluate literary devices and elements, author's voice and modes of characterization.
- **Mastery**
  Ninth grade students performing at the mastery level read, analyze and synthesize grade level texts to explain historical, cultural and biographical influences on literary works. Students explain literary devices and elements, author's voice and modes of characterization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level read grade level texts to identify historical, cultural, and biographical influences on literary works. Students recognize basic literary devices and elements.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.9.2.1	address specific purposes (e.g., narrative; expository; descriptive; persuasive) by employing writing strategies.
RLA.9.2.2	generate topics and plan approaches to writing by using pre-writing strategies.
RLA.9.2.3	employ drafting strategies for specific writing tasks.
RLA.9.2.4	create a well-developed composition from a prompt.
RLA.9.2.5	develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement.
RLA.9.2.6	develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay; chronological order in a process essay).
RLA.9.2.7	use different transitional devices (e.g., introductory and transitional phrases/conjunctions) between paragraphs.
RLA.9.2.8	develop a composition that uses complete and varied sentences.
RLA.9.2.9	develop a composition with appropriate and precise word choice.
RLA.9.2.10	use revision and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.9.2.11	access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog, electronic media).
RLA.9.2.12	extend note-taking skills to process and organize information.
RLA.9.2.13	recognize the concept of intellectual property and plagiarism (e.g., media copyright laws; public/private domain).
RLA.9.2.14	develop outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.9.2.15	practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.9.2.16	recognize choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.9.2.17	recognize the parts of speech within a sentence.
RLA.9.2.18	recognize the various parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive).
RLA.9.2.19	identify editing strategies to correct errors in capitalization and punctuation.
RLA.9.2.20	recognize and correct errors in subject/verb agreement.
RLA.9.2.21	recognize and correct errors in pronoun case usage and pronoun/antecedent agreement.
RLA.9.2.22	recognize and correct run-on sentences, fragments, misplaced modifiers and awkward constructions.
RLA.9.2.23	form supportable predictions, opinions, inferences and conclusions based upon text.
RLA.9.2.24	expand vocabulary through various literary works.
RLA.9.2.25	identify word etymologies to determine meaning.

Performance Descriptors (RLA.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level write compositions that contain a refined thesis statement, subtle transition, elevated diction and pertinent sentence structure germane to the writing. Students independently apply the rules of intellectual property.
- **Mastery**
  Ninth grade students performing at the mastery level write diverse compositions that integrate a clear and logical thesis statement, transitional devices, precise diction, varied sentence structure and a clear, logical progression of supported ideas. Students extend research skills by applying the rules of intellectual property to compositions.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level write compositions that show evidence of a thesis statement, basic transition, limited diction, complete sentences and a progression of ideas. Students identify and explain the rules of intellectual property.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.9.3.1 understand, communicate and follow complex directions effectively.
RLA.9.3.2 review appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in the appropriate tone and at the appropriate time).
RLA.9.3.3 review listening behaviors prior to a school wide audience activity (e.g., staying alert; resisting distractions; identifying and adapting to the speaker's purpose).
RLA.9.3.4 listen to identify the purpose, make predictions, distinguish fact from opinion and construct meaning from discussion, speech or media.
RLA.9.3.5 recognize and correct usage errors in oral language.

Performance Descriptors (RLA.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level effectively design and communicate intricate directions. Students synthesize meaning from discussion, speech and media to communicate supportable opinions.
- **Mastery**
  Ninth grade students performing at the mastery level effectively communicate complex directions. Students construct meaning from discussion, speech and media through observation and participation.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level effectively communicate simple directions. Students determine meaning from discussion, speech and media through observation and/or participation.

Tenth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts tenth grade students will use written language for educational, occupational and personal endeavors. Preparation will include critiquing oral presentations and using listening, speaking and viewing while reading and writing. Instructional delivery will be enhanced by a wide variety of media. Frequent interaction with a broadened array of literature will encourage an increased appreciation and understanding for the power of the spoken and written word across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.10.1.1 analyze and research historical, cultural and biographical influences of literary works.
RLA.10.1.2 compare and contrast literary styles according to genre.
RLA.10.1.3 increase the amount of independent reading with emphasis on American, British and World literature.
RLA.10.1.4 employ reading strategies necessary for various reading purposes (e.g., literary experience; information; and task performance).
RLA.10.1.5 continue to use context clues to establish word meaning (e.g., including words with multiple meanings).
RLA.10.1.6 recognize characteristics of author's style, purpose and tone.
RLA.10.1.7 form supportable predictions, opinions, inferences and conclusions based upon a text and/or implicit ideas.
RLA.10.1.8 explain the author's choice of literary devices (e.g., personification; symbolism; imagery; metaphor; simile; humor; rhythm; rhyme; meter; alliteration; assonance).
RLA.10.1.9 recognize persuasive language and techniques (e.g., advertisements; junk mail; news stories).
RLA.10.1.10 expand vocabulary through classic literature.
RLA.10.1.11 explain word etymologies to determine meaning.

Performance Descriptors (RLA.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level read, synthesize and evaluate advanced level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works. Students examine the universality of literature to determine the interrelationship among literary works.
- **Mastery**
  Tenth grade students performing at the mastery level read and analyze grade level texts to form supportable predictions, opinions, inferences and conclusions from implicit ideas. Students research and analyze the impact of historical, cultural and biographical factors on literary works.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery read grade level texts to form predictions, opinions, inferences and conclusions. Students identify and explain the impact of historical, cultural, and biographical factors on literary works.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.10.2.1 employ writing strategies to address specific audiences (e.g., narrative; expository; descriptive; persuasive).
RLA.10.2.2 use pre-writing strategies to generate topics and plan approaches to writing by using timed writing tasks.

RLA.10.2.3 from a writing prompt, create a well-developed composition illustrating various points of view (e.g., omniscient or limited).
RLA.10.2.4 develop a composition that addresses the assigned topic with a clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.10.2.5 develop a timed writing that is focused and coherent and has a clear, logical progression of ideas.
RLA.10.2.6 use different transitional devices (e.g., introductory and internal transitional phrases/conjunctions).
RLA.10.2.7 develop a composition that contains sentence variety.
RLA.10.2.8 develop a composition where word choice is vivid, precise and economical.
RLA.10.2.9 correct errors in timed writing to correct errors in organization, content, usage, mechanics (e.g., capitalization; punctuation) and spelling using revision and editing strategies.
RLA.10.2.10 access and evaluate a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media; newspapers).
RLA.10.2.11 extend note-taking skills to process and organize information (e.g., paraphrase; summary; quote).
RLA.10.2.12 explain the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; public/private domain).
RLA.10.2.13 expand outlining skills to organize text and composition information by selecting main points and supporting details.
RLA.10.2.14 practice correct use of bibliographic format in research documentation (e.g., MLA; APA).
RLA.10.2.15 explain word etymologies to determine meaning.
RLA.10.2.16 compare and contrast choice of pronunciation and spelling (e.g. dictionary; spell check; thesaurus).
RLA.10.2.17 classify the parts of speech within a sentence.
RLA.10.2.18 recognize the parts of a sentence (e.g., direct object; predicate adjective; gerund; infinitive; word usage variations).
RLA.10.2.19 recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns.
RLA.10.2.20 use correct verb tense by recognizing appropriate situations for tense shifts.
RLA.10.2.21 recognize and correct errors in sentence structure (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Performance Descriptors (RLA.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level write focused compositions that exhibit a well-discerned and placed thesis statement, sophisticated diction and insightful detail. Students experiment with point of view leading to the development of a personal voice. Students extend research skills by incorporating information into compositions using correct documentation.
- **Mastery**
  Tenth grade students performing at the mastery level write focused compositions. Students integrate a correctly placed thesis statement, vivid and economical diction, specific, relevant details and various points of view. Students extend research skills incorporating information into compositions using correct documentation.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery write basic compositions with limited focus. Students incorporate a thesis statement, simplistic diction, sporadic detail and a shifting point of view. Students extend research skills by transferring information into compositions using documentation.

Standard 3: Listening, Speaking and Viewing (RLA.S.3)

Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives

Students will:

RLA.10.3.1 communicate and follow intricate directions.
RLA.10.3.2 employ appropriate classroom communication skills (e.g., asking and answering questions to foster comprehension and communication in appropriate tone and at the appropriate time).

RLA.10.3.3 listen to a speech (e.g., funeral orations from Shakespeare's *Julius Caesar*) to identify specific examples of central idea, fact versus opinion and persuasive devices.

RLA.10.3.4 recognize and correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - formal versus informal).

RLA.10.3.5 practice and master listening, speaking and viewing by using a variety of techniques (e.g., videos, power point presentations; audiotape; web pages).

Performance Descriptors (RLA.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level automatically evaluate and apply conventions of oral language. Students assess the merit of persuasive devices from multiple sources to determine and debate credibility.
- **Mastery**
  Tenth grade students performing at the mastery level recognize and apply conventions of oral language by distinguishing colloquial, dialectical, slang and formal language. Students construct meaning from multiple sources by analyzing persuasive devices to determine credibility.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level recognize conventions of oral language. Students determine basic meaning from multiple sources by identifying and paraphrasing persuasive language.

Eleventh Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts eleventh grade students will refine and enhance foundational literary and communication skills through academic rigor and depth. Career formalization, including college entrance exam preparation and workplace readiness skills, will become a primary focus. Challenging research and writing skills will be emphasized across the curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)

Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives

Students will:

RLA.11.1.1 research, analyze and evaluate the historical, cultural and biographical influences of literary works.

RLA.11.1.2 analyze literary styles according to genre.

RLA.11.1.3 increase the amount of independent reading with emphasis on classic American, British and World literature.

RLA.11.1.4 select appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.11.1.5 analyze characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.11.1.6 draw supportable conclusions, make inferences and generalizations, and interpret character traits.

RLA.11.1.7 expand vocabulary through various literary works and apply word etymologies to determine meaning.
RLA.11.1.8 recognize and interpret various literary devices, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).
RLA.11.1.9 analyze types of texts according to content, structure and tone.
RLA.11.1.10 read literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:
RLA.11.2.1 employ writing strategies to address specific purposes and audiences (e.g., narrative; expository; descriptive and/or persuasive).
RLA.11.2.2 generate topics and plan approaches to writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.11.2.3 employ drafting strategies for interdisciplinary writing tasks.
RLA.11.2.4 develop a composition from a student-generated clearly worded and correctly placed thesis statement which is supported by relevant details.
RLA.11.2.5 develop a composition that is focused and coherent and has a clear, logical progression of ideas.
RLA.11.2.6 use vocabulary that is vivid, precise and economical.
RLA.11.2.7 identify and use subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.11.2.8 identify rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.11.2.9 produce functional writing (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.11.2.10 produce a researched essay or project following an accepted format (e.g., MLA; APA).
RLA.11.2.11 find and develop personal style and voice in writing.
RLA.11.2.12 in functional and research writing, use revisions and editing strategies to correct errors in organization, content, usage, mechanics and spelling.
RLA.11.2.13 access and evaluate information through a variety of sources (e.g., *Reader's Guide*; card catalog; electronic media).
RLA.11.2.14 extend efficient note taking skills with careful attention to identifying purpose, main ideas/key facts and overall themes in order to synthesize information into a well-developed essay.
RLA.11.2.15 apply the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.11.2.16 produce a suitable outline for use in a researched essay or project.
RLA.11.2.17 apply choices of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.11.2.18 analyze the parts of a sentence (e.g., direct object; predicate adjective, gerund; infinitive; word usage variations).
RLA.11.2.19 select appropriate editing strategies to correct errors in punctuation.
RLA.11.2.20 recognize and correct errors in subject verb agreement and verb tense.
RLA.11.2.21 recognize and correct errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with:

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.11.3.1 design and communicate complex directions.

RLA.11.3.2 continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation).

RLA.11.3.3 correct usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang - and formal versus informal language).

RLA.11.3.4 practice and master listening, speaking and viewing objectives (e.g., videos; PowerPoint presentations; web pages; evaluating a selection on audiotape).

Twelfth Grade Reading and English Language Arts Content Standards and Objectives

Reading and English Language Arts twelfth grade students will focus and polish personal skills and goals. Experiences such as a senior project or a sophisticated persuasive research paper will culminate the graduation experience. Readiness for the work place or post secondary education is the final educational reality check during the twelfth grade year. The expansion and appreciation of language and literature in spoken and written form is a primary focus. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Reading (RLA.S.1)
Students will use skills to read for literacy experiences, read to inform and read to perform a task by:

- identifying and using the dimensions of reading (phonemic awareness, phonics, background knowledge/vocabulary, high frequency words/fluency, comprehension, writing and motivation to read); and
- employing a wide variety of literature in developing independent readers.

Reading Objectives
Students will:

RLA.12.1.1 research, analyze and evaluate the historical, cultural and biographical influences to determine the impact on literary works.

RLA.12.1.2 analyze and evaluate author's choice of genre

RLA.12.1.3 increase the amount of independent reading with emphasis on American, British and World literature.

RLA.12.1.4 automatically apply appropriate reading strategies necessary for various reading purposes (e.g., literary experience; information; task performance).

RLA.12.1.5 analyze and evaluate characteristics of author's style, purpose and technique from a variety of selections (e.g., critical review; literary/character analysis).

RLA.12.1.6 construct supportable conclusions, make inferences and generalizations, and interpret character traits from explicit and implicit ideas.

RLA.12.1.7 analyze and evaluate persuasive language and techniques (e.g., advertisements; junk mail; web sites; news stories).

RLA.12.1.8 expand vocabulary through various literary works and analyze word and etymologies to determine meaning.

RLA.12.1.9 interpret and evaluate the author's choice of various literary devices and techniques, in particular, figurative language (e.g., personification; archetypes; allegorical patterns).

RLA.12.1.10 analyze and evaluate types of text according to content, structure and tone.

RLA.12.1.11 read and evaluate literary criticism applicable to the genre being studied.

Standard 2: Writing (RLA.S.2)
Students will employ a wide range of writing strategies to communicate effectively for different purposes by:

- developing the writing process;
- applying grammatical and mechanical properties in writing; and
- gathering and using information for research purposes.

Writing Objectives
Students will:

RLA.12.2.1 employ writing strategies to address specific purposes (e.g., narrative; expository; persuasive; research; creative).
RLA.12.2.2 generate topics and plan approaches to research writing (e.g., graphic organizers; outlines) using pre-writing strategies.
RLA.12.2.3 employ drafting strategies for research writing tasks.
RLA.12.2.4 develop a focused composition that has a clear and logical progression of ideas supported by relevant details.
RLA.12.2.5 expand the use of vocabulary that is vivid, precise and economical.
RLA.12.2.6 expand the use of subtle forms of transition in a composition (e.g., sentence links; repetition of key words or sentences).
RLA.12.2.7 apply rhetorical devices (e.g., parallel structure; antithesis; narrative pace).
RLA.12.2.8 write an analysis of a literary selection using terminology and characteristics of the genre and quotations (e.g., apostrophe; symbolism; imagery).
RLA.12.2.9 produce functional writing related to life skills (e.g., letter of job application; scholarship application; essay; personal letter).
RLA.12.2.10 produce a summative project (e.g., research paper, power point presentation; web page) using an accepted format (e.g., MLA; APA).
RLA.12.2.11 refine a personal style and voice in writing.
RLA.12.2.12 correct errors in organization, content, usage, mechanics and spelling through all writing using revisions and editing strategies.
RLA.12.2.13 access and evaluate information through a variety of primary and secondary sources (e.g., personal interviews; SIRS; *Congressional Quarterly*).
RLA.12.2.14 employ a sound note taking system that can be applied to classroom, library and/or interview.
RLA.12.2.15 integrate the concept of intellectual property and plagiarism in all media (e.g., media copyright laws; private/public domain).
RLA.12.2.16 produce a detailed outline for use in a summative project.
RLA.12.2.17 analyze and select choice of pronunciation and spelling (e.g., dictionary; spell check; thesaurus).
RLA.12.2.18 select appropriate editing strategies to correct all errors in mechanics.
RLA.12.2.19 recognize and correct all errors in subject/verb agreement.
RLA.12.2.20 correct all errors in sentence structure and usage (e.g., parallelism; redundancy; misplaced modifiers; subordination).

Standard 3: Listening, Speaking and Viewing (RLA.S.3)
Students will apply their use of spoken, written and/or visual language to communicate with

- a variety of audiences; and
- for different purposes.

Listening, Speaking and Viewing Objectives
Students will:

RLA.12.3.1 adapt and apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion; oral presentation; guest speaker).
RLA.12.3.2 correct all usage errors in oral language (e.g., distinguishing colloquial - dialectical - slang, and formal versus informal language).
RLA.12.3.3 practice and master listening, speaking and viewing skills (e.g., videos; power point presentations; web pages; and evaluate a selection on audio tape).

SCIENCE

The science content standards identify what students should know, understand and be able to do in the natural sciences throughout their K-12 education. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

Doing Science:
- Standard 1 - History and Nature of Science
- Standard 2 - Science as Inquiry

Knowing Science:
- Standard 3 - Unifying Themes
- Standard 4 - Science Subject Matter/Concepts

Context of Science:
- Standard 5 - Scientific Design and Application
- Standard 6 - Science in Personal and Social Perspectives

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge.

Standard 1. History and the Nature of Science

The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures.

Standard 2. Science as Inquiry

Science is a process of discovery. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 3. Unifying Themes

Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes.

Standard 4. Science Subject Matter/Concepts

Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the interrelationships among biology, chemistry, physics and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 5. Scientific Design and Application

Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely.

Standard 6. Science in Personal and Social Perspectives

Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use education technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-10. Students in the 11th and 12th grades participate in advanced in-depth laboratory-based elective courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Science Content Standards K-12

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Kindergarten Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the physical sciences, the life sciences and the earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands-on manipulation of objects to build a strong foundation of concepts blended with safety principles. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.K.1.1 ask questions about themselves and their world.
SC.K.1.2 listen to stories about the lives and discoveries of scientists.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.K.2.1 demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural objects (e.g., trees, leaves, animal structures).
SC.K.2.2 explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.K.2.3 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets).
SC.K.2.4 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.K.2.5 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.K.3.1 recognize that models are representations of real things.
SC.K.3.2 observe that change occurs gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:
Characteristics of Organisms
SC.K.4.1 using the five senses, identify living and non-living things.
Life Cycles of Organisms
SC.K.4.2 observe the movement, growth and changes in plants and animals.
Organisms and Environments
SC.K.4.3 observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field).
Properties of Objects and Materials
SC.K.4.4 describe, compare, sort and group objects in terms of what they are made of (clay, cloth, paper, metal, etc.) and their physical properties of size, shape, color, weight or texture.
SC.K.4.5 identify liquids and solids.
Light, Heat, Electricity and Magnetism
SC.K.4.6 identify colors.
SC.K.4.7 explore changes in energy (e.g., hot/cold and light/dark).
SC.K.4.8 explore magnetic properties of objects.
Position and Motion of Objects
SC.K.4.9 explore the different ways objects can be moved (e.g., straight, circular, fast, slow).
Changes in Earth and Sky
SC.K.4.10 observe and record daily changes in weather (e.g., clouds, air temperature).
Objects in the Sky
SC.K.4.11 identify objects in the day and night sky (e.g., moon, stars, sun).
Properties of Earth Materials
SC.K.4.12 observe and compare differences in earth materials.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives.
Students will:
SC.K.5.1 observe the uses of tools and appliances at home and at play.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives.
Students will:
SC.K.6.1 work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) One objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:
SC.1.1.1 ask questions about themselves and their world.
SC.1.1.2 discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:
SC.1.2.1 demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles; motion of celestial objects; sun and shadow).
SC.1.2.2 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, rocks).
SC.1.2.3 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.1.2.4 collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, models).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:
SC.1.3.1 identify that systems are made of parts that interact with one another.
SC.1.3.2 use models as representations of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.1.4.1 classify objects as living or non-living.
SC.1.4.2 identify that most living things need water, food, light and air.

Life Cycles of Organisms

SC.1.4.3 recognize changes in life cycle of living organisms.
SC.1.4.4 identify the parts of growing plants as they develop.

Organisms and Environments

SC.1.4.5 depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, worms burrowing in soil).

Properties of Objects and Materials

SC.1.4.6 recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.1.4.7 recognize that materials can be recycled and used again, sometimes in different forms.
SC.1.4.8 recognize that water can be a solid or a liquid, and can change from one form to another.
SC.1.4.9 predict and investigate the buoyancy of objects in water.

Light, Heat, Electricity and Magnetism

SC.1.4.10 classify objects as magnetic or non-magnetic.
SC.1.4.11 observe and record shadows at different times of the day.

Position and Motion of Objects

SC.1.4.12 describe the changes in the motion of objects (e.g., slowing, speeding up, curving)
SC.1.4.13 demonstrate that sounds are produced by vibrations.

Changes in Earth and Sky

SC.1.4.14 observe, identify and record changes in weather and effects on living organisms.
SC.1.4.15 recognize that the sun, moon, and stars appear to move.

Objects in the Sky

SC.1.4.16 observe and discuss the importance of objects in the day and night sky.

Properties of Earth Materials

SC.1.4.17 use a model to compare land and water features on the Earth.
SC.1.4.18 identify important uses of air.
SC.1.4.19 investigate and compare the properties of soil (e.g., sand, clay, humus).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.1.5.1 distinguish between natural and man-made objects.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.1.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.1.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g. recycling, trash clean-up)

Second Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.2.1.1 recognize science as the human's search for an understanding of the world by asking questions about themselves and their world.

SC.2.1.2 discuss the lives and discoveries of scientists of different cultures and backgrounds.

SC.2.1.3 identify and discuss the role of community people in science careers.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.2.2.1 demonstrate curiosity, initiative and creativity by observing, classifying and comparing the patterns, variations and interactions of natural objects in the environment.

SC.2.2.2 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, calculators).

SC.2.2.3 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears).

SC.2.2.4 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).

SC.2.2.5 conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants; temperature and weather).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.2.3.1 identify that systems are made of parts that interact with one another.

SC.2.3.2 use models as representations of real things.

SC.2.3.3 observe that changes occur gradually, repetitively, or randomly within the environment.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.2.4.1 identify that plants and animals have different structures.
SC.2.4.2 identify the structures of physical characteristics of living things and explain their functions (e.g., wings for flying, fins for swimming; roots for support and obtaining water).

Life Cycles of Organisms

SC.2.4.3 sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.2.4.4 relate observations of the butterfly's life cycle to student's own growth and change.

Organisms and Environments

SC.2.4.5 observe and compare simple models of different kinds of habitats, including a forest and a stream.

Properties of Objects and Materials

SC.2.4.6 identify materials as a solid, a liquid or a gas and recognize that matter can change from one state to another.
SC.2.4.7 demonstrate that solids, liquids and gases take up space.

Light, Heat, Electricity and Magnetism

SC.2.4.8 demonstrate that a magnet can attract or repel objects.
SC.2.4.9 recognize that some materials and colors conduct heat better than others.
SC.2.4.10 demonstrate that a shadow is cast when an object blocks light.

Position and Motion of Objects

SC.2.4.11 compare the effects of force on the motion of an object.
SC.2.4.12 recognize that sound can change in pitch and volume.

Changes in Earth and Sky

SC.2.4.13 examine changes in the earth's surface (e.g., weathering, erosion).
SC.2.4.14 identify the effects of wind movement.
SC.2.4.15 observe and describe different types of precipitation.
SC.2.4.16 compare seasonal changes.
SC.2.4.17 explain how the rotation of the Earth on its axis causes day and night.

Objects in the Sky

SC.2.4.18 understand that the moon has phases.

Properties of Earth Materials

SC.2.4.19 describe how fossils are formed.
SC.2.4.20 match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur bones, shell, fern).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.2.5.1 recognize that common objects and events incorporate science (e.g., CD players, velcro, weather) to solve human problems and enhance the quality of life.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.2.6.1 listen to and be tolerant of different viewpoints while working in collaborative groups.

SC.2.6.2 develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, power consumption reduction).

Third Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights science-related careers. The study of geology and astronomy expands in CATS Three. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.3.1.1 recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.3.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.3.1.3 explore science careers in the community.

Performance Descriptors (SC.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level cite examples of changes in scientific knowledge over time. Students compare and contrast science careers in the community.
- **Mastery**
  Third grade students performing at the mastery level identify that there are changes in scientific knowledge over time; and identify science careers in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify science careers in the community.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.3.2.1 demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.3.2.2 recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.3.2.3 support statements with facts found through research in reference books, science-related magazines and the Internet.
SC.3.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, metric ruler, magnets, weather instruments, thermometer, calculators).
SC.3.2.5 use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely).
SC.3.2.6 apply mathematical skills and use metric units in measurements.
SC.3.2.7 interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.3.2.8 test variables (e.g., those that affect plant growth; speed; action of water on soil; shadow formation)

Performance Descriptors (SC.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level make predictions and inferences. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.
- **Mastery**
  Third grade students performing at the mastery level make predictions. Students use appropriate scientific equipment to measure and collect data (e.g., metric rulers, scales, beakers). Students identify safe and proper techniques for handling, manipulating and caring for science materials.
- **Partial Mastery**
  Third grade students performing at the partial mastery level use appropriate scientific equipment to measure and collect data (e.g., metric rulers, beakers). Students identify safe and proper techniques for handling, manipulating, and caring for science materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.3.3.1 identify that systems are made of parts that interact with one another.

SC.3.3.2 use models as representations of real things.

SC.3.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.3.3.4 given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations).

SC.3.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.3.3)

- **Distinguished**
  Third grade students performing at the distinguished level explain that systems are made of parts that interact with one another. Students compare and contrast the changes that occur within systems. Students construct models to represent real things.
- **Mastery**
  Third grade students performing at the mastery level identify that systems are made of parts that interact with one another. Students identify and describe that changes occur within systems. Students identify that models are representations of real things.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify that systems are made of parts that interact with one another. Students identify that models are representation of real things.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Characteristics of Organisms

SC.3.4.1 identify the structures of living things, including their systems and explain their functions (e.g., roots absorb water, circulatory system to move materials).

Life Cycles of Organisms

SC.3.4.2 observe, measure and record changes in living things (e.g., growth and development, variations within species).

Organisms and Environments

SC.3.4.3 compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers).

SC.3.4.4 observe and describe relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships).

Properties of Objects and Materials

SC.3.4.5 relate the buoyancy of an object to its density.

SC.3.4.6 identify physical and chemical properties.

SC.3.4.7 relate changes in states of matter to changes in temperature.

SC.3.4.8 investigate the dissolving of solids in liquids.

Light, Heat, Electricity and Magnetism

SC.3.4.9 investigate the absorption, reflection and refraction of light by objects.

SC.3.1.10 relate how the color of an object is based upon the absorption or reflection of light.

Position and Motion of Objects

SC.3.4.11 recognize that it takes work to move objects over a distance.

SC.3.4.12 recognize that speed, distance, and time are interrelated.

SC.3.4.13 recognize that the greater a force is exerted on an object, the greater the change of its motion will be.

SC.3.4.14 identify examples of potential and kinetic energy.

Changes in Earth and Sky

SC.3.4.15 identify fossils as a record of time (e.g., what organisms once lived on Earth, where they lived).

SC.3.4.16 explore the eroding of different materials by water and wind (e.g., sand, mud pile and rocks).

SC.3.4.17 describe how volcanoes and earthquakes change the Earth.

Objects in the Sky

SC.3.4.18 recognize the relative movement of the Sun and Moon in relationship to the Earth's position.

SC.3.4.19 describe the similarities and differences among the planets.

Properties of Earth Materials

SC.3.4.20 identify properties of minerals and recognize that rocks are composed of different minerals.

SC.3.4.21 explain how igneous, sedimentary and metamorphic rocks are formed.

SC.3.4.22 identify geographical features using a model or map (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes).

SC.3.4.23 describe the layers of the Earth and their various features.

Performance Descriptors (SC.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications; develop justifications for solutions to problems; and generate interconnections among the categories listed above.
- **Mastery**
  Third grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Third grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.3.5.1 cite examples of the uses of science and technology in common daily events and in the community.

SC.3.5.2 explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.

Performance Descriptors (SC.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level describe the uses of science and technology in the community and throughout the world.
- **Mastery**
  Third grade students performing at the mastery level identify the uses of science and technology in the community.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify the uses of science and technology within the home.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.3.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal).

SC.3.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented.

SC.3.6.3 develop respect and responsibility for the environment by engaging in conservation practices.

SC.3.6.4 describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Performance Descriptors (SC.PD.3.6)

- **Distinguished**
  Third grade students performing at the distinguished level describe the impact that their personal choices have on the quality of life. Students cite and classify resources as renewable or nonrenewable and engage in conservation practices.
- **Mastery**
  Third grade students performing at the mastery level identify the impact that personal choices have on the quality of their lives. Students identify resources as renewable or nonrenewable and engage in conservation practices.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize resources as renewable and nonrenewable and engage in conservation practices.

Fourth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Four objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.4.1.1 contrast changes in scientific knowledge resulting from new discoveries (e.g., new knowledge leads to new questions).
SC.4.1.2 study the lives and discoveries of scientists of different cultures and backgrounds.
SC.4.1.3 explore science careers in West Virginia.

Performance Descriptors (SC.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level analyze and draw conclusions about changes in scientific knowledge over time. Students compare and contrast science careers in West Virginia.
- **Mastery**
  Fourth grade students performing at the mastery level contrast changes in scientific knowledge over time. Students identify science careers in West Virginia.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify changes in scientific knowledge over time and identify science careers in West Virginia.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.4.2.1 demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.

SC.4.2.2 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.

SC.4.2.3 support statements with facts found through research in reference books, science-related magazines, multimedia and the Internet.

SC.4.2.4 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, telescope, thermometer, balances, magnets, tuning forks, bulbs and batteries, graduated cylinders, calculators, computers).

SC.4.2.5 demonstrate safe and proper techniques for handling, manipulating and caring for science materials.

SC.4.2.6 construct a hypothesis when provided a problem.

SC.4.2.7 establish variables and controls in an experiment; test variables through experimentation.

SC.4.2.8 interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.

SC.4.2.9 draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, variation of plants).

SC.4.2.10 apply mathematical skills and use metric units in measurements and calculations.

Performance Descriptors (SC.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level develop questions and propose solutions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating and caring for scientific materials.
- **Mastery**
  Fourth grade students performing at the mastery level develop questions; use scientific instruments to make observations, measure and collect data; extract information from charts, tables and graphs. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop questions and make observations using scientific instruments. Students demonstrate safe and proper techniques for handling, manipulating, and caring for scientific materials.

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.4.3.1 identify that systems are made of parts that interact with one another.

SC.4.3.2 use models as representations of real things.

SC.4.3.3 observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.

SC.4.3.4 given a set of objects, group or order the objects according to an established scheme.

SC.4.3.5 given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.

Performance Descriptors (SC.PD.4.3)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the relationship between the form of an object or system and its function. Students construct models to represent systems.
- **Mastery**
  Fourth grade students performing at the mastery level identify and describe how modifications to the parts of a system affect interactions between its parts. Students construct models to represent systems.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level identify observable changes to the parts of the system. Students construct models to represent systems.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Characteristics of Organisms

SC.4.4.1 describe the different characteristics of plants and animals which help them to survive in different niches and environments.

SC.4.4.2 associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, seasons).

SC.4.4.3 identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, leaves).

Life Cycles of Organisms

SC.4.4.4 compare and sequence changes in plant and animal life cycles.

SC.4.4.5 understand that plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.

Organisms and Environments

SC.4.4.6 identify human uses of plants and animals (e.g., food sources, medicines).

SC.4.4.7 describe environmental barriers to the migration of animals.

SC.4.4.8 construct and explain models of habitats, food chains, and food webs.

Properties of Objects and Materials

SC.4.4.9 investigate how properties can be used to identify substances.

SC.4.4.10 investigate and compare the dissolving of different solids in a given liquid.

SC.4.4.11 examine simple chemical changes (e.g., tarnishing, rusting, burning).

SC.4.4.12 understand that materials including air mass, take up space and are made of parts that are too small to be seen without magnification.

SC.4.4.13 identify various changes in states of matter to heat loss or gain.
SC.4.4.14 investigate variables that affect the rate of evaporation of a liquid.
SC.4.4.15 investigate the density of liquids.

Light, Heat, Electricity and Magnetism

SC.4.4.16 identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, light to mechanical).
SC.4.4.17 examine types and properties of waves (e.g., transverse, longitudinal, frequency, wavelengths).
SC.4.4.18 investigate static electricity and conductors/nonconductors of electricity.
SC.4.4.19 construct simple electrical circuits.
SC.4.4.20 understand the relationship between a compass and a magnetic field.

Position and Motion of Objects

SC.4.4.21 relate motion of an object to its frame of reference.
SC.4.4.22 predict and investigate the motion of an object if the applied force is changed.
SC.4.4.23 explore that sounds are produced by vibrating objects and columns of air and explore the relationship between frequency and pitch of sound.
SC.4.4.24 investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, rubber band).

Changes in Earth and Sky

SC.4.4.25 become familiar with the geologic time scale.
SC.4.4.26 locate and identify patterns of stars and their seasonal changes.
SC.4.4.27 compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile).
SC.4.4.28 investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.4.4.29 interpret a weather chart or map.

Objects in the Sky

SC.4.4.30 identify the sun as a star.
SC.4.4.31 describe the orbits of the Sun and Moon.
SC.4.4.32 describe and explain the planets orbital paths.

Properties of Earth Materials

SC.4.4.33 describe the rock cycle.
SC.4.4.34 explain the relationship between the rate of cooling and crystal size of igneous rocks .
SC.4.4.35 compare ocean water and fresh water.

Performance Descriptors (SC.PD.4.4)

- **Distinguished**

  Fourth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Characteristcs of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students critique scientific applications: develop justifications for solutions to problems; and generate interconnections among the categories listed above.

- **Mastery**
  Fourth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Characteristics of Organisms
  - Life Cycles of Organisms
  - Organisms and Environments
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Changes in Earth and Sky
  - Objects in the Sky
  - Properties of Earth Materials

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.4.5.1 identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.4.5.2 use an appropriate engineering design to solve a problem or complete a task.

Performance Descriptors (SC.PD.4.5)
- **Distinguished**
  Fourth grade students performing at the distinguished level develop an appropriate engineering design for a given task and produce a product or process that exceeds the task requirements.
- **Mastery**
  Fourth grade students performing at the mastery level identify an appropriate engineering design for a given task and produce a product or process to meet the task requirements.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level develop an engineering design for a given task and produce a product or process that does not meet the task requirements.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.4.6.1 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology).

SC.4.6.2 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.

SC.4.6.3 describe the positive and negative consequences of the application of technology on personal health and the environment.

SC.4.6.4 develop respect and responsibility for the environment by engaging in conservation practices.

Performance Descriptors (SC.PD.4.6)

- **Distinguished**
  Fourth grade students performing at the distinguished level compare and contrast the positive and negative consequences of technology applications on personal health, populations, and the environment.
- **Mastery**
  Fourth grade students performing at the mastery level describe the positive and negative consequences of technology application on personal health, populations and the environment.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list the consequences of technology on personal health, populations and on the environment.

Fifth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions and motions of objects and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.5.1.1 realize that scientists formulate and test their explanations of nature using observation and experiments.

SC.5.1.2 recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.

SC.5.1.3 examine the careers and contributions of men and women of diverse cultures to the development of science

SC.5.1.4 articulate the historical significance of scientific discoveries.

Performance Descriptors (SC.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Mastery**
  Fifth grade students performing at the mastery level explain the careers and contributions of men and women from diverse cultures and articulate the historical significance of their scientific discoveries.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize careers and contributions of men and women from diverse cultures.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.5.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.5.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.5.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.5.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.5.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.5.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.5.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.5.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level develop questions, generate hypothesis, propose solutions and draw conclusions. Students use scientific instruments to make observations, measure, and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Mastery**
  Fifth grade students performing at the distinguished level develop questions and propose solutions. Students use scientific instruments to make observations, measure and collect data. Students collect, organize and display their data; extract information from charts, tables and graphs. Students routinely apply safety techniques.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level develop questions; use scientific instruments to make observations, measure and collect data; use information from charts, tables and graphs. Students routinely apply safety techniques.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.5.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take a part or build mechanical, electrical, or biological systems).

SC.5.3.2 construct a variety of useful models of an object, event, or process.

SC.5.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.5.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.5.3)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the relationships between the forms of objects or systems and their functions. Students design models to represent systems.
- **Mastery**
  Fifth grade students performing at the mastery level use models to explain the relationship between the form of an object or system and its function.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify that there is a relationship between form and function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.5.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

<u>Structure and Function in Living Systems</u>

SC.5.4.2 identify and explain common energy conversions in cycles of matter including photosynthesis and carbon dioxide cycle.

SC.5.4.3 identify the structures of living organisms and explain their function.

SC.5.4.4 observe and identify cells of organisms using a microscope.

<u>Life Cycles of Organisms: Reproduction and Heredity</u>

SC.5.4.5 compare variations of plant growth and reproduction.

<u>Populations and Ecosystems</u>

SC.5.4.6 explain how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, extinction.

SC.5.4.7 explore the extinction of a species due to environmental conditions.

SC.5.4.8 trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.

<u>Properties of Objects and Materials</u>

SC.5.4.9 explain that the mass of a material is conserved whether it is together, in parts, or in a different state.

SC.5.4.10 recognize that elements are composed of only one type of matter.

SC.5.4.11 using the periodic table, identify common elements according to their symbols.

SC.5.4.12 identify substances by their relative densities (e.g., floating; sinking).

Light, Heat, Electricity and Magnetism

SC.5.4.13 analyze diagrams of electrical circuits.

SC.5.4.14 use SI (metric) measurement units of volts, amps and watts as they apply to electricity.

SC.5.4.15 investigate the properties of an electromagnet.

Position and Motion of Objects

SC.5.4.16 describe how the variables of gravity and friction affect the motion of objects.

SC.5.4.17 compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.

Structure of the Earth System

SC.5.4.18 describe the layers of the earth and their various features.

SC.5.4.19 identify and describe natural landforms, how they change and impact weather and climate.

SC.5.4.20 use a variety of instruments and sources to collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation).

SC.5.4.21 compare and explain the different rates of weathering, erosion and deposition in certain materials.

SC.5.4.22 identify land features and elevations on a topographical map.

SC.5.4.23 identify resources as being renewable or non-renewable.

Earth's History

SC.5.4.24 explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.

SC.5.4.25 identify that the Earth is made of plates (plate tectonics).

Performance Descriptors (SC.PD.5.4)

- **Distinguished**

  Fifth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Fifth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Fifth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Properties of Objects and Materials
  - Light, Heat, Electricity and Magnetism
  - Position and Motion of Objects
  - Structure of the Earth System
  - Earth's History

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.5.5.1 research everyday applications and interactions of science and technology.
SC.5.5.2 implement engineering solutions for given tasks and measure their effectiveness.

Performance Descriptors (SC.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the interactions between science and technology in daily living. Given a task, students implement an engineering solution, measure and evaluate its effectiveness.
- **Mastery**
  Fifth grade students performing at the mastery level describe the interactions between science and technology in daily living. Given a task, students implement an engineering solution and measure its effectiveness.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify interactions between science and technology in daily living.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:
SC.5.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.
SC.5.6.2 evaluate and critically analyze mass media reports of scientific developments and events.
SC.5.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).
SC.5.6.4 explore the connections between science, technology, society and career opportunities.
SC.5.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.5.6)

- **Distinguished**
  Fifth grade students performing at the distinguished level analyze the causes/effects of science and technology on global and local problems. Students identify and describe the connections between science, technology, society and career opportunities.
- **Mastery**
  Fifth grade students performing at the mastery level analyze the cause/effect of science and technology on global and local problems. Students identify the connections between science, technology, society and career opportunities.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level list causes/effects of science and technology on local problems.

Sixth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.6.1.1 explain that scientists formulate and test their explanations of nature using observation and experiments.

SC.6.1.2 recognize that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.6.1.3 associate the careers and contributions of men and women of diverse cultures to the development of science.

SC.6.1.4 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level use historical examples to show how scientists formulate and test their explanations. Students provide evidence of how careers relate with scientific fields of study.
- **Mastery**
  Sixth grade students performing at the mastery level explain how scientists formulate and test their explanations. Students associate careers with scientific fields of study.
- **Partial Mastery**
  Sixth grades students performing at the partial mastery level recall how scientists formulate and test their explanations. Students match careers with specific scientific fields of study.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.6.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.6.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.6.2.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.6.2.4 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.6.2.5 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.6.2.6 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.6.2.7 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.6.2.8 use inferential reasoning to make logical conclusions from collected data.

SC.6.2.9 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

Performance Descriptors (SC.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate selected scientific processes and skills, such as formulating questions, making predictions, and forming hypothesis for a given problem; analyze records for consistency and accuracy; construct appropriate charts, tables and graphs. Students explain safety techniques and choose proper equipment to solve the problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Sixth grade students performing at the mastery level use scientific processes and skills to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; organize data into appropriate charts, tables and graphs. Students explain safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify scientific process and skills used to formulate questions, make predictions and form hypothesis; maintain consistent and accurate records; select appropriate data on charts, tables and graphs. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.6.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.6.3.2 construct a variety of useful models of an object, event, or process.

SC.6.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.6.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.6.3)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the accuracy of models (e.g. physical, pictorial) of objects or systems and predict how to manipulate variables to improve the model.
- **Mastery**
  Sixth grade students performing at the mastery level design models (e.g. physical, pictorial) of objects or systems and predict how variables affect their function.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level use models (e.g. physical, pictorial) of objects or systems and identify and describe how changing variables effects their function.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.6.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.6.4.2 describe the interactions of various cycles that provide energy through decomposition, photosynthesis, respiration, transpiration in the food web; nitrogen cycle.

SC.6.4.3 classify living organisms according to their structure and functions.

SC.6.4.4 compare the similarities of internal features of organisms which can be used to infer relatedness.

SC.6.4.5 explain how abiotic and biotic factors affect the interdependence among organisms.

SC.6.4.6 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts).

Life Cycles of Organisms: Reproduction and Heredity

SC.6.4.7 compare growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants).

Populations and Ecosystems

SC.6.4.8 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat).

SC.6.4.9 analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).

Structure and Properties of Matter

SC.6.4.10 classify and investigate properties and processes (changes) as either physical and chemical.

SC.6.4.11 investigate the composition of matter concluding that matter is composed of tiny particles and that the particles are the same for the same type of matter.

SC.6.4.12 investigate the formation and separation of simple mixtures.

SC.6.4.13 use indicators to identify substances as acidic, basic or neutral.

SC.6.4.14 identify the symbols of elements.

SC.6.4.15 use the periodic table to identify elements as solids, liquids and gases, metals or nonmetals.

SC.6.4.16 describe properties of matter (e.g., inertia, specific heat, malleability, melting point, density).

Energy

SC.6.4.17 investigate the properties electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray).

SC.6.4.18 identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium).

SC.6.4.19 explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors).

SC.6.4.20 describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals).

SC.6.4.21 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch).

Motion and Forces

SC.6.4.22 interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.6.4.23 examine simple machines and the forces involved; apply the effects of balanced and unbalanced forces on motion of objects.

SC.6.4.24 explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.

Structure of the Earth System

SC.6.4.25 track major atmospheric events.

SC.6.4.26 describe and demonstrate the forces and results of plate tectonics.

Earth's History

SC.6.4.27 describe changes in the rock record due to geologic and physical events over time. (e.g., rock cycle as it relates to plate tectonics.).

Earth and the Solar System

SC.6.4.28 recognize the phases of the Moon.

SC.6.4.29 investigate models of Earth-Moon-Sun relationships (e.g., gravity, time, tides).

SC.6.4.30 compare the Earth's tilt and revolution to the seasonal changes.

Performance Descriptors (SC.PD.6.4)

- **Distinguished**

  Sixth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Sixth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.6.5.1 given a set of attributes, produce a product or process and cite how design priorities (e.g., space, safety) and available materials impact the outcome.

SC.6.5.2 evaluate the appropriateness of the materials and procedures in given engineering solutions.

Performance Descriptors (SC.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict the consequences of using inappropriate materials in engineering solutions.
- **Mastery**
  Sixth grade students performing at the mastery level examine engineering solutions and evaluate the appropriateness of the materials and procedures.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level describe the solution of an engineering task and evaluate the appropriateness of the materials and procedures.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.6.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.6.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.6.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.6.6.4 explore the connections between science, technology, society and career opportunities.

SC.6.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.6.6)

- **Distinguished**
  Sixth grade students performing at the distinguished level provide alternative points of view on ways science/technology/society impacts specific health, population, resources and environmental practices.
- **Mastery**
  Sixth grade students performing at the mastery level describe how science/technology/society impacts specific health, population, resources and environmental practices.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify how science/technology/society impacts specific resources and environmental practices.

Seventh Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.7.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.7.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.7.1.3 examine the role of skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.7.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.7.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level when given a scientific investigation, scrutinize the motives and evaluate the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students predict the impact of current scientific contributions of men and women of diverse cultures on society.
- **Mastery**
  Seventh grade students performing at the mastery level explain the role of skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students interpret the impact of the scientific contributions of men and women of diverse cultures on society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level list examples of the role played by skepticism, recognizing bias, methodology, logical reasoning and creativity in scientific investigations. Students list scientific contributions of men and women of diverse cultures on society.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.7.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.7.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.7.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.7.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.7.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.7.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.7.2.7 use appropriate technology solutions to gather data; graph data; interpret data; and analyze information.

SC.7.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level design an experiment that incorporates independent, dependent, controlled variables; use multiple trials in an experiment for reliability; suggest multiple alternative approaches to investigations. Students apply safety techniques and choose the proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Mastery**
  Seventh grade students performing at the mastery level identify independent, dependent, controlled variables; and use multiple trials in an experiment for reliability. Students suggest an alternative approach to investigations. Students apply safety techniques using proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level define independent, dependent, controlled variables and explain why multiple trials in an experiment are necessary for reliability. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.7.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical or biological systems).

SC.7.3.2 construct a variety of useful models of an object, event or process.

SC.7.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.7.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD.7.3)

- **Distinguished**
  Seventh grade students performing at the distinguished level, given a set of conditions, predict and defend future changes that could occur in an object or system over time.
- **Mastery**
  Seventh grade students performing at the mastery level analyze and describe the changes that occur in an object or system over time.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level describe the changes that occur in an object or system over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.7.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

Structure and Function in Living Systems

SC.7.4.2 identify and describe disease causing organisms and the diseases they cause such as bacteria, viruses, protozoa, fungi.

SC.7.4.3 explain how the skeletal, muscular and integumentary systems work together in the human body.

SC.7.4.4 compare the level of organization of cells, tissues and organs in living things.

SC.7.4.5 construct simple keys to differentiate among living things with similar characteristics.

SC.7.4.6 use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, and carbon cycle).

Life Cycles of Organisms: Reproduction and Heredity

SC.7.4.7 evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations).

SC.7.4.8 analyze how changes in the environment have led to reproductive adaptations through natural selection.

SC.7.4.9 relate how an organisms behavior response is a combination of heredity and environment.

SC.7.4.10 analyze the differences in the growth, development and reproduction of flowering and non-flowering plants.

Populations and Ecosystems

SC.7.4.11 predict the trends of interdependent populations if one of the limiting factors is changed.

SC.7.4.12 evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations).

Structure and Properties of Matter

SC.7.4.13 differentiate among elements, compounds, homogeneous and heterogeneous mixtures.

SC.7.4.14 evaluate types of solutions (e.g., solutes and solvents relative concentrations, conductivity, pH).

Chemical Reactions

SC.7.4.15 study chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.

SC.7.4.16 write word equations to describe chemical reactions.

Energy

SC.7.4.17 describe the behavior of individual particles and verify the conservation of matter (e.g., melting and freezing of pure substances).

SC.7.4.18 trace the energy flow during phase changes

SC.7.4.19 define characteristics of light and sound waves and describe how sound is perceived by the ear and light is perceived by the eye.

SC.7.4.20 investigate application of lenses to science (e.g., microscopes, telescopes, magnifying glass, periscopes).

SC.7.4.21 identify characteristics of AC and DC circuits.

SC.7.4.22 explain conservation of matter and energy qualitatively and recognize that energy can be changed from one form to another.

Motion and Forces

SC.7.4.23 perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.

SC.7.4.24 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon).

SC.7.4.25 analyze motion graphically and use vectors to represent direction of motion.

Structure of the Earth System

SC.7.4.26 depict and relate causes of tides, surfs and currents.

SC.7.4.27 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy.

SC.7.4.28 interpret and create topographical maps.

Earth's History

SC.7.4.29 compare and contrast periods of geologic time using rocks and rock layers.

Earth and the Solar System

SC.7.4.30 explain and model using manipulatives how the Earth's tilt and revolution determine the seasonal changes and weather patterns.

SC.7.4.31 recognize the changes involved in the life cycle of a star.

SC.7.4.32 describe and compare the physical characteristics of celestial objects.

SC.7.4.33 compare the characteristics of the members of our solar system.

Performance Descriptors (SC.PD.7.4)

- **Distinguished**

  Seventh grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Seventh grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Seventh grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.7.5.1 make and compare different proposed solutions to an identified problem in light of specified criteria.

SC.7.5.2 test and evaluate different types of materials and/or design approaches in building objects or completing tasks.

Performance Descriptors (SC.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level illustrate the variations between two designs using different materials to solve an engineering problem and defend each design.
- **Mastery**
  Seventh grade students performing at the mastery level predict the consequences of using inappropriate materials in engineering solutions.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level distinguish between appropriate and inappropriate materials in engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.7.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.7.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.7.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.7.6.4 explore the connections between science, technology, society and career opportunities.

SC.7.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.7.6)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze the personal motives and societal cost and benefits of health, population, resources and environmental practices.
- **Mastery**
  Seventh grade students performing at the mastery level describe the personal and societal costs and benefits of health, population, resources and environmental practices.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the personal and societal cost and benefits of health, population, resources and environmental practices.

Eighth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.8.1.1 realize that scientists formulate and test their explanations of nature using observation, experiments and theoretical models.

SC.8.1.2 recognize and appreciate that scientific knowledge is subject to modification as new scientific information challenges current theories.

SC.8.1.3 apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.

SC.8.1.4 examine the careers and contributions of men and women of diverse cultures to the development of science.

SC.8.1.5 articulate the historical significance of scientific discoveries as influenced by technological demands, competition, controversy, world events, personalities and societal issues.

Performance Descriptors (SC.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level make inferences about changes in scientific knowledge using current and historical scientific discoveries. Students trace the development of a key historical discovery.
- **Mastery**
  Eighth grade students performing at the mastery level make inferences about changes in science knowledge using current and historical scientific discoveries.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify changes that have occurred in scientific knowledge using current or historical discoveries.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.8.2.1 cooperate and collaborate to ask questions, find answers, solve problems, conduct investigations to further an appreciation of scientific discovery.

SC.8.2.2 formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.

SC.8.2.3 use a variety of materials and scientific instruments to conduct explorations, investigations and experiments of the natural world (e.g., barometer, anemometer, microscope, computer).

SC.8.2.4 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.

SC.8.2.5 utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables).

SC.8.2.6 construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.

SC.8.2.7 use appropriate technology solutions to gather, graph and interpret data and analyze information.

SC.8.2.8 use inferential reasoning to make logical conclusions from collected data.

Performance Descriptors (SC.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level design an experiment that solves a problem; collect, organize and graph the data applying the measurement of central tendency and frequency to draw conclusions. Students apply safety techniques and use proper equipment to solve the problem (Science Subject Matter/Concept appropriate).
- **Mastery**
  Eighth grade students performing at the mastery level organize, graph, analyze data and draw conclusions from data collected in experiments; calculate measures of central tendency (mean, median, mode) and frequency. Students routinely apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level organize, graph and analyze data and draw conclusions from data collected in experiments. Students apply safety techniques and use proper equipment to solve problems (Science Subject Matter/Concept appropriate).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.8.3.1 compare and contrast the relationship between the parts of a system to the whole system (e.g., take apart or build mechanical, electrical, or biological systems).

SC.8.3.2 construct a variety of useful models of an object, event, or process.

SC.8.3.3 compare and contrast changes that occur in an object or a system to its original state.

SC.8.3.4 identify the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, flight characteristics of different-sized model airplanes).

Performance Descriptors (SC.PD. 8.3)

- **Distinguished**
  Eighth grade students performing at the distinguished level construct a scale model and design a test to show the effects of variation in scale.
- **Mastery**
  Eighth grade students performing at the mastery level construct scale models and predict the influences that a variation in scale will have on an object or system.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level compare scale models of an object or system. Describe the effects of variation in scale on the object or system.

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

SC.8.4.1 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

SC.8.4.2 identify and explain the structures and functions of cell organelles.

SC.8.4.3 explain how the circulatory, respiratory and reproductive systems work together in the human body.

SC.8.4.4 compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.

SC.8.4.5 demonstrate how living cells obtain the essentials of life through chemical reactions of transpiration, respiration and photosynthesis.

Life Cycles of Organisms: Reproduction and Heredity

SC.8.4.6 analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal).

SC.8.4.7 demonstrate the basic principles of genetics to include Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits.

SC.8.4.8 examine how patterns of human development are similar to other vertebrates.

Populations and Ecosystems

SC.8.4.9 group unknown organisms based on observable characteristics (e.g., use dichotomous keys).

SC.8.4.10 trace matter and energy flow in a food web as it goes from sunlight to producers to consumers, design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition).

Structure and Properties of Matter

SC.8.4.11 use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.

SC.8.4.12 trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford, Bohr).

SC.8.4.13 determine the number of protons, neutrons and electrons and use information to draw a Bohr model of the atom.

SC.8.4.14 assign an element to its chemical family on the periodic table and note similarities in outer energy level electrons within each family.

SC.8.4.15 evaluate gaseous systems noting the variation in diffusion rates and examine the expansion of gases at elevated temperatures.

Chemical Reactions

SC.8.4.16 conduct and classify chemical reactions by reaction type (synthesis, decomposition, single replacement or double replacement); energy type (endothermic and exothermic); and write word equations for the chemical reactions.

SC.8.4.17 identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies and particle size.

Energy

SC.8.4.18 identify types of energy and their sources (e.g., petroleum refinement, windmills, geothermal).

SC.8.4.19 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass).

SC.8.4.20 apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical).

SC.8.4.21 quantitatively represent work, power, pressure (e.g., W=fd, P=W/t, pressure =force/area).

Motion and Forces

SC.8.4.22 graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time).

SC.8.4.23 describe Newton's Laws of Motion; identify examples; illustrate qualitatively and quantitatively drawing vector quantities.

SC.8.4.24 illustrate quantitatively mechanical advantage of simple machines.

Structure of the Earth System

SC.8.4.25 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water).

SC.8.4.26 identify the principle forces of plate tectonics and related geological events.

SC.8.4.27 relate global patterns of atmospheric movement on local weather and the impact of oceans on weather and climate.

Earth's History

SC.8.4.28 relate rock formations to the types of fossil fuels.

SC.8.4.29 describe the factors involved in mining resources.

SC.8.4.30 construct and interpret rock layer models through stratigraphic interpretation.

Earth and the Solar System

SC.8.4.31 recognize societal concerns with exploration and colonization of space.

SC.8.4.32 diagram the motions of the Sun, Moon and Earth and explain the phenomena associated with these motions (e.g., glacial periods, eclipses, tides, meteor showers).

SC.8.4.33 compare and contrast the orbits of planets and comets.

SC.8.4.34 compare and contrast the different types of galaxies (e.g., shape, size, components).

Performance Descriptors (SC.PD.8.4)

- **Distinguished**

  Eighth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**
  Eighth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students explain interconnections among the categories listed above.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - Structure and Function in Living Systems
  - Life Cycles of Organisms: Reproduction and Heredity
  - Populations and Ecosystems
  - Structure and Properties of Matter
  - Chemical Reactions
  - Energy
  - Motion and Forces
  - Structure of the Earth System
  - Earth's History
  - Earth and the Solar System

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.8.5.1 research applications of space technology in everyday life (e.g., velcro, teflon, weather satellites).
SC.8.5.2 compare scientific inquiry and technological design processes.
SC.8.5.3 explain why no technological design is perfect (e.g., constraints lead to tradeoffs).
SC.8.5.4 design and construct engineering solutions to problems according to specified constraints.

Performance Descriptors (SC.PD.8.5)
- **Distinguished**
  Eighth grade students performing at distinguished level evaluate the design of an engineering solution to identify the compliance within specific constraints (e.g., environmental issues, aesthetics, financial limitations).
- **Mastery**
  Eighth grade students performing at the mastery level design and construct an engineering solution to a given problem with specified constraints (e.g., environmental issues, aesthetics, financial limitations).

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the influences of specified constraints (e.g., environmental issues, aesthetics, financial limitations) on an engineering solution.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.8.6.1 use scientific reasoning and the knowledge of science and technology to make informed personal decisions at the local and global levels.

SC.8.6.2 evaluate and critically analyze mass media reports of scientific developments and events.

SC.8.6.3 critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality).

SC.8.6.4 explore the connections between science, technology, society and career opportunities.

SC.8.6.5 analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances.

Performance Descriptors (SC.PD.8.6)

- **Distinguished**
  Eighth grade students performing at the distinguished level design a strategy to counteract the negative effects of science/technology/society on a global or local problem.
- **Mastery**
  Eighth grade students performing at the mastery level analyze and evaluate effects of science/technology/society on global and local problems.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level describe the science/technology/society effects on a global or local problem.

Ninth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth and sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. Subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

SC.9.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
SC.9.1.2 recognize that science has practical and theoretical limitations.
SC.9.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
SC.9.1.4 conclude that science is a blend of creativity, logic and mathematics.
SC.9.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level match scientific explanations to historical observations and experimental evidence and identify variability in experimental results. Students describe the historical setting accounting for the evolvement of key historical concepts and principals.
- **Mastery**
  Ninth grade students performing at the mastery level paraphrase scientific explanations for historical observations and experimental evidence and support through examples that science is a blend of creativity, logic and mathematics. Students trace the development of key scientific concepts and principles.
- **Partial Mastery**
  Ninth grade students performing at partial mastery identify scientific explanations for historical observations and experimental evidence and recognize that science is a blend of creativity, logic and mathematics. Students relate the development of key scientific concepts and principles.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

SC.9.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.9.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.9.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.9.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.9.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.9.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

SC.9.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives and applying).

SC.9.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Performance Descriptors (SC.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze those skills and/or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a complex, real world application.
- **Mastery**
  Ninth grade students performing at the mastery level select those skills and/or values, to include ethical practices that exemplify scientific inquiry. Students conduct safe experiments and draw conclusions given a real world application.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level select those skills and or values including ethical practices that exemplify scientific inquiry. Students conduct safe experiments and choose appropriate conclusions.

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

SC.9.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.9.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.9.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.9.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.9.3)

- **Distinguished**
  Ninth grade students performing at the distinguished level use mathematical models incorporating both graphs and equations to predict short- and long-term changes in cyclical and linear biological and physical systems.
- **Mastery**
  Ninth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level use mathematical models incorporating graphs or equations to describe systems in equilibrium and those that are evolving.

Standard 4: Science Subject Matter/Concepts
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives (SC.S.4)
Students will:

SC.9.4.1 demonstrate an understanding of the interconnections of biological, earth/space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.9.4.2 analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, multiple alleles, DNA, probability, diversity).

SC.9.4.3 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

The Interdependence of Organisms

SC.9.4.4 mathematically illustrate changes in populations of organisms.

SC.9.4.5 identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens).

SC.9.4.6 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Matter, Energy, and Organization in Living Systems

SC.9.4.7 explain how excretory, digestive systems work together in the human body.

SC.9.4.8 identify and compare the structure and function of cell, tissues and systems of different organisms.

SC.9.4.9 identify the organisms and the chemical processes involved in the decay of materials.

SC.9.4.10 trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Structure and Properties of Matter

SC.9.4.11 using the element's position on the Periodic Table, predict physical and chemical properties.

SC.9.4.12 describe the characteristics of radioactivity substances including alpha particles, beta particles and gamma rays; the half life of a radioactive isotope; a chain reaction; and differentiate between fission and fusion.

SC.9.4.13 investigate the relationship between the density of an object, its mass, and its volume.

SC.9.4.14 investigate physical states of matter including descriptions of the behavior of atoms and molecules in terms of the Kinetic Molecular Theory.

Chemical Reaction

SC.9.4.15 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

SC.9.4.16 identify the various types of chemical bonds and the resulting compounds that are formed (e.g., ionic, nonpolar covalent, polar covalent).

SC.9.4.17 experimentally determine the products of chemical reactions; write balanced chemical equations; classify type of reaction; and describe energy changes.

Energy

SC.9.4.18 identify, describe and differentiate various forms of energy and energy transformations.

SC.9.4.19 relate absorption and dissipation of heat to the composition of a material.

SC.9.4.20 demonstrate and diagram a magnetic field using bar magnets and iron fillings.

SC.9.4.21 hypothesize and experiment when different components are substituted in an electrical circuit; define and solve electrical problems involving potential difference, Ohm's Law and power.

Motions and Forces

SC.9.4.22 relate the forces between charged objects to the charge on the objects and the distance between them.

SC.9.4.23 review foundational concepts of kinematics (e.g., speed-distance-time relationships) and dynamics (e.g., Newton's Laws, simple machines).

SC.9.4.24 experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum.

SC.9.4.25 investigate types of waves and their properties including interference, diffraction, resonance; differences and similarities between transverse and longitudinal waves; wave equation to determine the relationships among speed, wavelength and frequency.

Energy in the Earth System

SC.9.4.26 investigate formation and destruction of landforms.

SC.9.4.27 demonstrate the relationships of temperature, air pressure, wind speed, wind direction and humidity as elements of weather.

SC.9.4.28 compare and analyze the characteristics of oceans, including their lateral and vertical motions.

Geochemical Cycles

SC.9.4.29 employ a variety of tests to identify common rock-forming minerals.

SC.9.4.30 analyze and describe common rock samples using grain size and shape, and mineral composition.

SC.9.4.31 use models to describe interactive cycles such as the water, the nitrogen and the carbon dioxide cycles.

Origin and Changes in the Earth Systems and Universe

SC.9.4.32 examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior.

SC.9.4.33 determine the relative age of materials using time-stratigraphic and bio-stratigraphic relationships.

SC.9.4.34 estimate the absolute age of materials using existing radioisotropic data.

SC.9.4.35 describe the effects of the movement of subsurface water.

SC.9.4.36 relate changes in the Earth's surface to the motion of lithospheric plates.

SC.9.4.37 summarize and discuss the evidentiary basis for the Theory of Plate Tectonics.

SC.9.4.38 research and describe the life cycles of various stellar types.

SC.9.4.39 interpret topographic maps, weather maps and charts, and astronomical models such as solar systems, galaxies, constellations, stellar types and stellar evolution.

Performance Descriptors (SC.PD.9.4)

- **Distinguished**

  Ninth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Ninth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:
  - The Cell and Molecular Basis for Heredity
  - The Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Changes in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:
- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:
SC.9.5.1 identify the scientific concepts underlying simple technological innovations.
SC.9.5.2 cite examples of the interdependence of science and technology (e.g., new technologies have lead to development of new scientific knowledge).
SC.9.5.3 apply scientific skills and technological tools to design a solution that addresses a personal or societal need.
SC.9.5.4 analyze the consequences of imposed constraints on an engineering solution.

Performance Descriptors (SC.PD.9.5)
- **Distinguished**
  Ninth grade students performing at the distinguished level evaluate the consequences of imposed constraints on engineering solutions and propose a design change.
- **Mastery**
  Ninth grade students performing at the mastery level analyze the consequences of imposed constraints on engineering solutions and propose a design change.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level describe the consequences of imposed constraints on engineering solutions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:
- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.9.6.1 research uses and values of natural resources.
SC.9.6.2 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues).
SC.9.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.9.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.9.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.9.6)

- **Distinguished**
  Ninth grade students performing at the distinguished level analyze how public policy decisions impact health, population, resources and environmental issues.
- **Mastery**
  Ninth grade students performing at the mastery level describe how public policy decisions impact health, population, resources and environmental issues.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify that public policy decisions impact health, population, resources and environmental issues.

Tenth Grade Science Content Standards and Objectives

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth and space sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications; cellular biology; molecular genetics; embryology; physical, chemical and nuclear changes; fossils and environmental concerns. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

SC.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

SC.10.1.2 recognize that science has practical and theoretical limitations.

SC.10.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

SC.10.1.4 conclude that science is a blend of creativity, logic and mathematics.

SC.10.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

Performance Descriptors (SC.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level will evaluate scientific explanations in historical context. Students analyze possible sources of variability in experimental results.
- **Mastery**
  Tenth grade students performing at the mastery level provide scientific evidence for phenomena within historical contexts. Students account for variability in experimental results.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level will evaluate scientific explanation in historical context. Students analyze possible sources of variability in experimental results.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

SC.10.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

SC.10.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

SC.10.2.3 apply scientific approaches to seek solutions for personal and societal issues.

SC.10.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

SC.10.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

SC.10.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

SC.10.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

SC.10.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Performance Descriptors (SC.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence. Students evaluate effectiveness of experimental design and propose revisions.
- **Mastery**
  Tenth grade students performing at the mastery level design, conduct, and evaluate safe experiments using appropriate skills, attitudes and/or values (including ethical practice). Students defend conclusions using scientific evidence.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level design, conduct, analyze safe experiments using appropriate skills, attitudes and/or values (including ethical practice).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

SC.10.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

SC.10.3.2 apply evidence from models to make predictions about interactions and changes in systems.

SC.10.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

SC.10.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Performance Descriptors (SC.PD.10.3)

- **Distinguished**
  Tenth grade students performing at the distinguished level design experiments that use mathematical models incorporating both graphs and equations to predict changes in systems. Students describe cyclical and linear systems that evolve over time.
- **Mastery**
  Tenth grade students performing at the mastery level use mathematical models incorporating both graphs and equations to predict short and long-term changes in cyclical and linear biological and physical systems.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use mathematical models incorporating both graphs and equations to compare cyclical or linear changes in biological and physical systems that evolve over time.

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

SC.10.4.1 demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.

<u>The Cell and Molecular Basis for Heredity</u>

SC.10.4.2 identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).

SC.10.4.3 compare the variations in cells, tissues and organs of different organisms (e.g. endocrine, nervous, digestion and immune systems).

SC.10.4.4 identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).

SC.10.4.5 explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.

SC.10.4.6 relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).

SC.10.4.7 review principles of genetics (e.g. number of chromosomes, mutations, crossover, Punnett squares, linkage).

<u>Evolution and Interdependence of Organisms</u>

SC.10.4.8 compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).

SC.10.4.9 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems).

SC.10.4.10 recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.

SC.10.4.11 relate the role of natural selection to the development, diversity and or extinction of a species.

<u>Matter, Energy, and Organization in Living Systems</u>

SC.10.4.12 construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

SC.10.4.13 explain how the nervous, endocrine and immune systems work together in the human body.

SC.10.4.14 review the needs of growing plants and the environments supplying those needs.

SC.10.4.15 review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).

SC.10.4.16 trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle and electron transport system (e.g., ATP, carbon, oxygen, water).

<u>Structure and Properties of Matter</u>

SC.10.4.17 investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Chemical Reaction

SC.10.4.18 differentiate between physical, chemical and nuclear changes and reactions.

Energy

SC.10.4.19 investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).

SC.10.4.20 investigate and measure changes in thermal energy in physical and chemical changes.

SC.10.4.21 compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.

SC.10.4.22 summarize the relationship between frequency and speed (e.g., Doppler effect).

SC.10.4.23 qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.

SC.10.4.24 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).

Motions and Forces

SC.10.4.25 apply Newton's Laws of Motion depict the relationship among rate, force, momentum and time using kinematics graph and mathematical models.

SC.10.4.26 describe and quantify how machines can provide mechanical advantages.

SC.10.4.27 determine the effect of different forces on vibrating systems (e.g., pendulums, springs).

SC.10.4.28 demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).

Energy in the Earth System

SC.10.4.29 relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).

SC.10.4.30 relate the cause of tides to their height and frequency.

SC.10.4.31 investigate effects of geological events on weather and climate (e.g., ocean currents).

SC.10.4.32 observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).

SC.10.4.33 investigate and compare theories of the source of the Earth's magnetic field and relate Earth's electromagnetic field to the dynamics of the magnetosphere.

SC.10.4.34 discuss theories for the causes of plate tectonics.

Geochemical Cycles

SC.10.4.35 discuss physical and chemical relationships between minerals in rock cycle.

Origin and Evolution in the Earth Systems and Universe

SC.10.4.36 investigate fossils as evidence for evolution and indicators of paleo-environments.

SC.10.4.37 compare and contrast morphological features of fossils to present-day organisms.

SC.10.4.38 use fossil evidence to estimate the relative and absolute ages of rock layers.

SC.10.4.39 compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.

SC.10.4.40 interpret apparent motion of constellations and their relationship to the rotation of the earth.

Performance Descriptors (SC.PD.10.4)

- **Distinguished**

  Tenth grade students performing at the distinguished level comprehend and apply the knowledge of objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students critique scientific applications; develop justifications for solutions to problems; articulate abstract concepts; and generate interconnections among the categories listed above.

- **Mastery**

  Tenth grade students performing at the mastery level comprehend and apply the knowledge of the objectives at the level indicated in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students explain interconnections among the categories listed above.

- **Partial Mastery**

  Tenth grade students performing at the mastery level demonstrate knowledge of the objectives in Standard 4 in the following categories:

  - The Cell and Molecular Basis for Heredity
  - Evolution and Interdependence of Organisms
  - Matter, Energy, and Organization in Living Systems
  - Structure and Properties of Matter
  - Chemical Reaction
  - Energy
  - Motions and Forces
  - Energy in the Earth System
  - Geochemical Cycles
  - Origin and Evolution in the Earth Systems and Universe

  Students identify interconnections among the above categories.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

SC.10.5.1 investigate and analyze the interdependence of science and technology.
SC.10.5.2 research and design solutions to a personal or a societal problem created by technology.
SC.10.5.3 compare and test modifications to an engineering design.
SC.10.5.4 utilize technology to communicate designs, results and conclusions.

Performance Descriptors (SC.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level propose improvements to engineering designs; test and evaluate their modifications; and communicate the effectiveness of their design changes.
- **Mastery**
  Tenth grade students performing at the mastery level compare and test modifications to an engineering design and communicate the effectiveness of their design changes.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level analyze and suggest an improvement to an engineering design.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

SC.10.6.1 investigate the effects of natural phenomena on the habitat and habitat change.
SC.10.6.2 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).
SC.10.6.3 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
SC.10.6.4 explore occupational opportunities in science and technology including the academic preparation necessary.
SC.10.6.5 engage in decision making activities and actions to resolve science-technology-society issues.

Performance Descriptors (SC.PD.10.6)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict the long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Mastery**
  Tenth grade students performing at the mastery level predict long-term societal impact of specific health, population, resource and environmental practices framed by public policy decisions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level describe the long-term societal impact of specific health, population, resource and environmental practices.

Eleventh and Twelfth Grade Science Content Standards and Objectives

Advanced Biology (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AB.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AB.1.2 recognize that science has practical and theoretical limitations.
AB.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AB.1.4 conclude that science is a blend of creativity, logic and mathematics.
AB.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AB.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AB.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AB.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AB.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AB.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AB.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AB.2.6 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and conduct research.

AB.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AB.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

AB.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AB.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AB.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AB.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Chemical Foundations

AB.4.1 review foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

AB.4.2 investigate the molecules of life and their function in the living systems.

Cell Function and Genetics

AB.4.3 identify the structure, functions, and interactions of eukaryotic cell organelles and their products.

AB.4.4 analyze the chemistry and structure of the cell membrane as it relates to import and export of molecules necessary for life, exploring osmosis, diffusion, active and passive transport and dialysis.

AB.4.5 research the diversity/uniqueness of cell types (compare differences in prokaryotic/eukaryotic, plant/animal cells; explore nerve cells, blood cells, gametes, etc.).

AB.4.6 explore capture and release of energy as demonstrated by photosynthesis, cellular respiration, fermentation, and the role of coenzymes and vitamins.

AB.4.7 investigate and discuss homeostasis.

AB.4.8 recognize and describe the phases of eukaryotic and prokaryotic cell cycles.

AB.4.9 identify the stages of mitotic and meiotic eukaryotic cell division and explain significance of the stages.

AB.4.10 investigate and discuss DNA as the agent of heredity.

AB.4.11 investigate and discuss the importance of replication and mutation in the diversity of life.

AB.4.12 evaluate the advantages of asexual and sexual reproduction.

AB.4.13 identify Mendel's 1st Law and 2nd Law of Genetics and apply these laws to predict phenotypic and genotypic ratios from mono and dihybrid crosses.

AB.4.14 explore basic phenotypic and genotypic genetics beyond Mendel including such things as incomplete dominance, gene interaction, codominance, multi-alleles, crossing over, genetic recombination; and influences of environment, development, sex and age.

AB.4.15 identify the function of DNA in replication and transfer of the genetic code .

AB.4.16 identify the function of the RNAs; messenger, transfer and ribosomal in the transcription and translation process of protein formation.

AB.4.17 recognize that differentiation is regulated through the expression of different genes.

AB.4.18 discuss the regulatory process in controlling gene function.

AB.4.19 introduce genetic engineering through current DNA technology practices and the social issues that it raises.

AB.4.20 discuss gene mutations.

Evolution

AB.4.21 discuss evidence of evolution and natural selection, including examples such as peppered moth, fossil records, biogeography, molecular biology and comparative anatomy.

AB.4.22 investigate and discuss that behavioral response is a set of actions determined in part by heredity and in part from experience.

AB.4.23 research pioneers and current authors of evolutionary ideas.

Classification of Organisms

AB.4.24 present overview of the taxonomy and systematics of living organisms comparing DNA as the modern basis of classification to older methods based on morphology.

AB.4.25 discuss reasons why viruses are not included in the modern classification system.

Human Systems

AB.4.26 explore the various systems of the human organism and their interactions.

Environment and Ecosystems

AB.4.27 investigate and discuss responses of organisms to internal and environmental stimuli.

AB.4.28 investigate and discuss that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

AB.4.29 investigate and discuss ecology as the interaction of living organisms and their nonliving environment.

AB.4.30 trace the energy flow through an ecosystem.

AB.4.31 investigate and discuss that the number of organisms any environment can support depends on the resources available.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AB.5.1 summarize technological advances in the biological sciences.

AB.5.2 investigate and analyze the interdependence of science and technology.

AB.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AB.5.4 describe the scientific concepts underlying technological innovations.

AB.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data, and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

AB.6.1 investigate and discuss the impact that humans may have on the quality of the biosphere such as depletion of the rainforest, pollution of estuaries, strip mining, depletion of fossil fuels and deterioration of ozone layer.

AB.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AB.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AB.6.4 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AB.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AB.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Biology - Technical Conceptual (11/12) Content Standards and Objectives

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and who are interested in the field of technical biology with the scientific knowledge and opportunities to develop the inquiry, problem solving and decision making abilities necessary for their future vocation. Biology - Technical Conceptual (11/12) is an alternative to Advanced Biology (11/12) and is designed to prepare students for technical careers. The course will provide an in-depth study in the chemical nature of life, cellular functions, microbiology, ecology, biotechnology, zoology and botany with application emphasis. It builds on the fundamental concepts developed in CATS 7-10 in a rigorous and integrated manner. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

BTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

BTC.1.2 recognize that science has practical and theoretical limitations.

BTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

BTC.1.4 conclude that science is a blend of creativity, logic and mathematics.

BTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

BTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

BTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

BTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

BTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

BTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

BTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

BTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

BTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

BTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

BTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

BTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

BTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

BTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Matter and Energy

BTC.4.1 trace matter and energy transfers occurring during photosynthesis, cell respiration, and fermentation.

BTC.4.2 explore material transport in and out of cells (e.g., diffusion and osmosis).

BTC.4.3 investigate the nature of light in relation to energy transformation in photosynthesis.

BTC.4.4 compare and describe the properties of sound waves and how they affect organisms (e.g. sound pollution, sonography, echolocation and animal vocalization).

BTC.4.5 investigate how electric and magnetic forces affect life.

Chemical Foundations

BTC.4.6 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

BTC.4.7 investigate the molecules of life and their function in the living systems.

BTC.4.8 estimate molecular weight through the diffusion of biological stains.

Conservation and Human Impact on the Environment

BTC.4.9 explain common problems related to conservation, use, supply and quality of water.

BTC.4.10 investigate recycling in relation to human consumption of natural resources.

BTC.4.11 describe landfills and sewage treatment facilities and how they work.

BTC.4.12 investigate and analyze the impact that humans have on the quality of the biosphere (e.g. locally, regionally, and globally).

BTC.4.13 use topographic maps and Geographic Information Systems (GIS) to investigate biological systems and patterns (e.g. land use).

BTC.4.14 examine global change over time (e.g. climatic trends, fossil fuel depletion, global warming, ozone depletion).

Populations and Ecosystems

BTC.4.15 investigate interspecific and intraspecific competition.

BTC.4.16 apply sampling techniques to the study of ecosystems.

BTC.4.17 investigate variations in ecosystem productivity.

BTC.4.18 investigate population biology.

BTC.4.19 investigate soil and soil organisms.

BTC.4.20 explain the mechanics of composting.

BTC.4.21 evaluate the effects of large scale use of fungicides and pesticides on the diversity of organisms.

BTC.4.22 discuss and categorize chemical hazards and how they impact life. (e.g. flammable, reactive, poisons, corrosive).

Cell Function and Genetics

BTC.4.23 review the structure and function of cell membranes.

BTC.4.24 review DNA as it relates to mitosis, meiosis and protein synthesis.

BTC.4.25 review basic genetics including incomplete dominance, gene interactions, co-dominance, multiple-alleles, crossing over, genetic recombinations, environmental influences, development, sex and age

BTC.4.26 analyze karyotypes and pedigrees as diagnostic tools.

BTC.4.27 research genetic engineering through current DNA technology and the social and ethical issues that it raises (e.g. bacterial production of human insulin, DNA, cloning, fingerprinting, etc.).

BTC.4.28 analyze gene expression and embryonic development.

Plants

BTC.4.29 compare and contrast hydrophytic, mesophytic and xerophytic plants.

BTC.4.30 investigate the diversity of plants, their habitat, transport system, reproduction and life cycle.

BTC.4.31 investigate methods of plant propagation (e.g. culturing techniques, hydroponics, cloning, grafting, vegetative propagation).

BTC.4.32 research forest-management practices (e.g. clear cutting, selective cutting, pruning, fire ecology).

BTC.4.33 research and evaluate the importance of cultivated and wild plants to human society, economics and the environment.

Animals

BTC.4.34 investigate and analyze animal distribution.

BTC.4.35 research variations in animal reproductive strategies.

BTC.4.36 explain animal behavior.

Life Cycles of Organisms

BTC.4.36 compare the characteristics, structures and life cycles of simple to complex organisms.

Application of Biotechnology Techniques

BTC.4.37 apply techniques of biotechnology to phylogenetics, forensics, paleontology, and human genetics.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

BTC.5.1 summarize technological advances in the biological sciences.

BTC.5.2 investigate and analyze the interdependence of science and technology.

BTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

BTC.5.4 describe the scientific concepts underlying technological innovations.

BTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

BTC.6.1 research current environmental issues pertaining to biology.
BTC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.
BTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
BTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Human Anatomy and Physiology (11/12)
Content Standards and Objectives

This advanced course is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical processes, tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive immunological, nervous and endocrine. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives

Students will:

HAP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

HAP.1.2 recognize that science has practical and theoretical limitations.

HAP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

HAP.1.4 conclude that science is a blend of creativity, logic and mathematics.

HAP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist=s contributions.

HAP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)

Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

HAP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

HAP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

HAP.2.3 apply scientific approaches to seek solutions for personal and societal issues .

HAP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

HAP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

HAP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

HAP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

HAP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)
Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives
Students will:

HAP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

HAP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

HAP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

HAP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Frame of Reference for Anatomical Studies

HAP.4.1 demonstrate knowledge of directional terminology necessary for anatomical location such as proximal, dorsal, medial, lateral, visceral, superficial and deep.

HAP.4.2 explore current literature and research related to human anatomy and physiology.

Chemical Level of Organization

HAP.4.3 review of foundational chemical concepts including atomic structure, bonding, chemical reactions, water and pH as they relate to living systems.

HAP.4.4 trace the transfer of energy in chemical molecular processes in the human body (e.g., glycolysis, Krebs cycle, electron transport system).

Cellular /Tissue/System Levels of Organization

HAP.4.5 identify the role of DNA in transcription and relate to types of RNA and protein synthesis.

HAP.4.6 identify the structure, functions and interactions of eukaryotic cell organelles and their products.

HAP.4.7 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems.

HAP.4.8 categorize, by structure and function, the various types of human tissue (e.g. muscle, epithelial, connective, nervous).

Systems Level of Organization

HAP.4.9 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

HAP.4.10 relate how bone tissue is important to the development of the human skeleton.
HAP.4.11 investigate the structure and function of the skeletal system, including identification of bones, markings on bones and articulations.
HAP.4.12 show the mechanism of muscle contraction on micro and macro levels.
HAP.4.13 recognize the relationship between the skeletal, neural and muscular systems.
HAP.4.14 research the musculature system including locations, origins, insertions, muscle groups and types of muscles.
HAP.4.15 classify, describe and investigate the various types of neurons emphasizing structure and function.
HAP.4.16 trace and describe a nervous impulse including a discussion of the sodium-potassium pump.
HAP.4.17 locate, identify and discuss the structure and function of the parts of the central nervous system.
HAP.4.18 illustrate the nerves and functions of the peripheral nervous system including the autonomic portions.
HAP.4.19 apply the knowledge of the structure of the ear and eye to their function/dysfunction in relationship to environmental perception.
HAP.4.20 discuss the specific role of enzymes and hormones to bodily functions.
HAP.4.21 explore the endocrine system emphasizing glands, hormonal control and problems in hormone production.
HAP.4.22 investigate the male and female reproductive systems including identification of structures and their functions.
HAP.4.23 relate the male and female reproductive systems to human growth and development.
HAP.4.24 compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis.
HAP.4.25 research the formation of gametes, fertilization and embryonic development.
HAP.4.26 analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance.
HAP.4.27 relate Mendel's laws of inheritance and DNA to genetic diseases such as sickle-cell anemia, chromosomal abnormalities, Tay-Sachs disease, Huntington's disease, etc.
HAP.4.28 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism.
HAP.4.29 illustrate how transport mechanisms in cells, tissues and/or organs depend on osmosis and mixture gradients.
HAP.4.30 examine the role of the digestive system in supplying nutrients (carbohydrates, proteins, lipids, vitamins, minerals, water).
HAP.4.31 explain how structures of the respiratory system are significant to communication, gas exchange and cellular respiration.
HAP.4.32 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.
HAP.4.33 investigate the composition of blood and compatibility of blood types.
HAP.4.34 describe the relationship of the excretory system to other organs and systems.

Human Immune Systems and Health

HAP.4.35 describe potential system failures in the human body due to genetic, nutritional, operational, disease, or environmental influences.
HAP.4.36 investigate the immunological system emphasizing its role in defense of the human organism.
HAP.4.37 investigate and research the causative factors, symptoms, prevention and treatment of diseases.
HAP.4.38 identify disorders related to each major system.

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

HAP.5.1 summarize technological advances in medicine and health.
HAP.5.2 investigate and analyze the interdependence of science and technology.
HAP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
HAP.5.4 describe the scientific concepts underlying technological innovations.
HAP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

HAP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
HAP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.
HAP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Chemistry (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of chemistry. *Advanced Chemistry* (Eleven/Twelve) is the advanced study of matter, its composition and its changes. This course is designed to build upon and extend the Chemistry concepts, skills and knowledge from the CATS 7-10 program. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AC.1.2 recognize that science has practical and theoretical limitations.
AC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AC.1.4 conclude that science is a blend of creativity, logic and mathematics.
AC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
AC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
AC.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data, interact with simulations; conduct research; and to present and communicate conclusions.

AC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, applying).

AC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument.).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

AC.4.1 review the classification of matter using the periodic table; the use the kinetic molecular theory to explain physical states of matter; physical and chemical properties; and physical and chemical changes.

Atomic Structure

AC.4.2 review Bohr model of the atom and calculation of subatomic particles - protons, neutrons, and electrons.

AC.4.3 research and evaluate the contributions of Dalton, Planck, Bohr, Einstein, and de Broglie, Heisenberg, and Schrodinger to the evolution of the atomic theory.

AC.4.4 identify four types of electron clouds (s, p, d, f) and describe the quantum number (n, l, m, s) for electrons.

AC.4.5 write electron configurations and associate electron configuration of elements with element location on periodic table.

AC.4.6 write electron dot structures for representative elements.

Bonding

AC.4.7 predict the formulas of ionic compounds and molecular compounds.

AC.4.8 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

AC.4.9 using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent and metallic bonds.

AC.4.10 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

AC.4.11 recognize simple organic functional groups and name simple organic compounds.

Stoichiometry

AC.4.12 predict the products and write balanced equations for the general types of chemical reactions.

AC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.

AC.4.14 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume.

AC.4.15 perform calculations using the combined and ideal gas laws.

AC.4.16 use molar mass to calculate the molarity of solutions, percentage composition, empirical formulas and formulas of hydrates.

AC.4.17 experimentally determine the empirical formulas of hydrates.

AC.4.18 perform stoichiometric calculations including mass-mass, mass-volume, volume-volume including problems to determine theoretical yield and to identify the limiting reactant.

Equilibrium

AC.4.19 experimentally determine the factors that influence the rate of reaction.

AC.4.20 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system.

Solution Chemistry

AC.4.21 review colligative properties.

AC.4.22 name and define acids and bases using Arrhenius, Bronsted-Lowry and Lewis definitions.

AC.4.23 predict the products upon adding water to both acidic and basic anhydrides.

AC.4.24 write and balance net ionic equations.

AC.4.25 solve problems using the solubility product constants.

AC.4.26 calculate the pH and/or pOH for various solutions and relate to the pH scale.

AC.4.27 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions.

Electrochemistry

AC.4.28 define oxidation and reduction in terms of electron transfer within reactions.

AC.4.29 construct electrolytic cells, write and balance the half-cell reactions and calculate cell voltage.

Reaction Dynamics

AC.4.30 calculate the enthalpy change in reactions using the heat of formation.

AC.4.31 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship.

Nuclear Chemistry

AC.4.32 write balanced nuclear equations and make predications using half-life values.

AC.4.33 list the biological effects of radiation and the units used to measure radiation.

AC.4.34 compare and contrast fusion and fission reactions.

AC.4.35 research the application of nuclear technology.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AC.5.1 summarize technological advances in chemistry.

AC.5.2 investigate and analyze the interdependence of science and technology.

AC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AC.5.4 describe the scientific concepts underlying technological innovations.

AC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AC.6.1 research current environmental issues pertaining to chemistry.

AC.6.2 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.

AC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Chemistry-Technical Conceptual (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an alternative to a traditional college preparatory course emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Chemistry -Technical Conceptual is the study of matter, its compostion and its changes. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment and society. Students will engage in active inquiries, investigations and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

CTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
CTC.1.2 recognize that science has practical and theoretical limitations.
CTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
CTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
CTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
CTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

CTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).
CTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).
CTC.2.3 apply scientific approaches to seek solutions for personal and societal issues.
CTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

CTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

CTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

CTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

CTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

CTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

CTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

CTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

CTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Properties of Matter

CTC.4.1 review the classification of matter and the properties of metals and nonmetals.

CTC.4.2 identify sources and uses of elements.

CTC.4.3 use the kinetic molecular theory to explain physical states of matter.

CTC.4.4 perform calculations using the gas laws.
CTC.4.5 apply the principle of distillation to the separation of liquids (e.g., petroleum or water purification).

Atomic Structure

CTC.4.6 review the parts of the atom.
CTC.4.7 review the relationship of an element's group and period position with its properties.
CTC.4.8 compare atomic and ionic electronic structures.

Bonding

CTC.4.9 review formula writing and ionic and covalent bonding.
CTC.4.10 recognize the impact of water's unusual physical properties.
CTC.4.11 predict solute solubility based on molecular polarity.

Stoichiometry

CTC.4.12 review balancing equations.
CTC.4.13 use dimensional analysis to perform unit conversions and to verify experimental calculations.
CTC.4.14 relate the mole concept to chemical formulas.
CTC.4.15 use moles to measure chemical quantities.
CTC.4.16 determine the percent composition by mass of the elements in a compound.
CTC.4.17 make connections between resource conservation and the Law of Conservation of Matter.
CTC.4.18 illustrate the concept of a limiting reagent.

Solution chemistry

CTC.4.19 review solution properties (e.g., solubility, conductivity, density, pH and colligative).
CTC.4.20 define solutions in terms of saturation.
CTC.4.21 perform solutions concentration calculations (e.g. molarity, ppm).
CTC.4.22 compare and contrast the properties of strong and weak acids and bases.
CTC.4.23 perform an acid-base neutralization reaction.

Electrochemistry

CTC.4.24 construct electrolytic cells to observe the reduction of ions into free metals and write the half reactions that occur.
CTC.4.25 predict reactions of metals with aqueous solutions using the Metal Activity Series.

Reaction Dynamics

CTC.4.26 review temperature and heat.
CTC.4.27 measure the flow of energy into or out of chemical reactions.
CTC.4.28 predict the effect of temperature and catalysts on reaction rates.
CTC.4.29 apply LeChatelier's Principle in determining equilibrium.

Carbon and Petroleum

CTC.4.30 draw and construct models for the first ten alkanes.
CTC.4.31 relate the properties of organic compounds to their functional groups (e.g., alcohol and esters).
CTC.4.32 demonstrate the formation of polymers from smaller molecules.
CTC.4.33 compare and contrast the use of petroleum as either a source of energy or as a fundamental ingredient of synthetic materials.

Nuclear Chemistry

CTC.4.34 review nuclear fusion and fission, isotopes and half-lives.
CTC.4.35 compare the penetrating energies of nuclear radiation.
CTC.4.36 balance simple nuclear equations.
CTC.4.37 explain practical applications of nuclear technology (e.g., radioactive dating, radioisotopes in medicine).

Standard 5: Scientific Design and Application (SC.S.5)
Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives
Students will:

CTC.5.1 summarize technological advances in chemistry.
CTC.5.2 investigate and analyze the interdependence of science and technology.
CTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.
CTC.5.4 describe the scientific concepts underlying technological innovations.
CTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)
Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives
Students will:

CTC.6.1 research current environmental issues pertaining to chemistry.
CTC.6.2 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.
CTC.6.3 explore occupational opportunities in science and technology including the academic preparation necessary.
CTC.6.4 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Environmental Earth Science (11/12)
Content Standards and Objectives

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Advanced Environmental Earth Science (11/12) is designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire to build on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AES.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
AES.1.2 recognize that science has practical and theoretical limitations.
AES.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
AES.1.4 conclude that science is a blend of creativity, logic and mathematics.
AES.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
AES.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives
Students will:

AES.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AES.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AES.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AES.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AES.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AES.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AES.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AES.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AES.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AES.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AES.3.3 measure changes in systems using graph and equations relating these to rate, scale, patterns, trends and cycles.

AES.3.4 understand that different characteristics, properties or relationships withing a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)

Students will:

- demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences; and
- apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives

Students will:

Dynamic Earth

AES.4.1 review foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships.

AES.4.2 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Geology

AES.4.3 identify components of the solid earth and the natural processes relating to its development.

AES.4.4 list, identify, and sequence eras, epochs and periods in relation to earth history and geologic development.

AES.4.5 utilize fossil evidence to estimate the relative and absolute ages of rock layers (time-stratographic and biostratographic).

AES.4.6 estimate the absolute age of materials using existing radioisotopic data.

AES.4.7 identify the type and composition of various minerals.

AES.4.8 investigate and explain the processes of the rock cycle.

AES.4.9 explain the relationship between pressure and temperature to the formation and reformation of rocks.

AES.4.10 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice).

AES.4.11 identify and describe tectonic forces relating to internal energy production and convection currents.

AES.4.12 understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface (e.g., volcanoes, earthquakes).

AES.4.13 construct and/or interpret information on topographic maps.

Oceanography

AES.4.14 identify and describe properties of our oceans (e.g., composition, physical features of the ocean floor, and life within the oceans).

AES.4.15 compare and contrast characteristics of the oceans, including their lateral and vertical motions.

AES.4.16 investigate the evolution of the ocean floor that results in the creation of new materials and features.

AES.4.17 investigate the stratification of the ocean (colligative properties and biological zonation).

Meteorology

AES.4.18 investigate and explain, heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation).

AES.4.19 predict the effects of ocean currents on climate.

AES.4.20 compare and contrast meteorological processes related to air masses, weather systems, and forecasting.

AES.4.21 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion).

Astronomy

AES.4.22 research theories concerning origins of the universe.

AES.4.23 apply Newton's Law of Universal Gravitation to the motion of celestial objects.

AES.4.24 investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies.

AES.4.25 investigate celestial bodies and their evolution.

AES.4.26 explain the relationships between location, navigation and time.

AES.4.27 compare ancient and modern methods and tools used to study astronomy.

AES.4.28 investigate the electromagnetic spectrum as related to observable phenomena in the universe.

Environment

AES.4.29 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact.

AES.4.30 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

AES.4.31 investigate and describe in detail the physical and chemical properties of water.

AES.4.32 explain common problems related to the conservation, use, supply and the quality of water.

AES.4.33 explore the relationships between the extraction and use of natural resources and the impact on the environment.

AES.4.34 research alternative energy sources.

AES.4.35 understand the fragile nature of the Earth.

AES.4.36 research and explain how the political system influences environmental decisions.

AES.4.37 investigate which federal and state agencies have responsibility for environmental monitoring and actions.

AES.4.38 develop decision-making skills with respect to addressing environmental problems.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AES.5.1 summarize technological advances in the earth sciences.

AES.5.2 investigate and analyze the interdependence of science and technology.

AES.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AES.5.4 describe the scientific concepts underlying technological innovations.

AES.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AES.6.1 research and explain how the political system influences environmental decisions.

AES.6.2 investigate the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic).

AES.6.3 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).

AES.6.4 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge.

AES.6.5 explore occupational opportunities in science and technology including the academic preparation necessary.

AES.6.6 engage in decision making activities and actions to resolve science-technology-society issues.

Advanced Physics (11/12)
Content Standards and Objectives

An advanced level course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, *Advanced* Physics (Eleven/Twelve) is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the CATS 7-10 program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

AP.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.

AP.1.2 recognize that science has practical and theoretical limitations.

AP.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.

AP.1.4 conclude that science is a blend of creativity, logic and mathematics.

AP.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.

AP.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

AP.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

AP.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

AP.2.3 apply scientific approaches to seek solutions for personal and societal issues.

AP.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

AP.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

AP.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

AP.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

AP.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order and organization; evidence, models and explanation; constancy, change and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

AP.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

AP.3.2 apply evidence from models to make predictions about interactions and changes in systems.

AP.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

AP.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

AP.4.1 review Newton's Laws of Motion.

AP.4.2 using both given information and laboratory collected data, calculate velocity and acceleration along linear and circular paths.

AP.4.3 solve multi-step problems involving velocity, acceleration and net force.

AP.4.4 apply both graphical, algebraic, and trigonometric solutions to vector, problems involving two or more vectors; calculate both vector components and resultants including projectile motion in both one and two dimensions.

AP.4.5 apply the concepts of potential and kinetic energy to final velocity of an object-independent of path; evaluate the conservation of energy and momentum in simple harmonic motion.

AP.4.6 investigate and calculate the work, energy, power, mechanical advantage, and efficiency using simple machines involving linear and rotational motion.

Fluids

AP.4.7 define fluids and determine the magnitude of buoyant force exerted on floating and submerged objects; explain why some objects float or sink.

AP.4.8 relate the pressure exerted by a fluid to its depth; calculate the pressure exerted by a fluid.

AP.4.9 examine the motion of a fluid; apply Bernoulli's equation to solve fluid problems; recognize the effects of Bernoulli's principle on fluid motion.

AP.4.10 define the general properties of an ideal gas; apply the Ideal Gas Law to predict the properties of an ideal gas under different conditions.

Thermodynamics

AP.4.11 distinguish between temperature and heat; relate these to kinetic energy and internal energy of matter; apply the principle of conservation of energy to calculate changes in potential, kinetic and internal energy.

AP.4.12 investigate and apply concepts of specific heat, heat of fusion and vaporization to calculate phase changes of materials, and perform calculations using the specific heat equation; interpret phase diagrams.

Waves, Sound and Optics

AP.4.13 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

AP.4.14 relate the wavelength, velocity and frequency of waves with the equation velocity=frequency x wavelength and use it to perform calculations.

AP.4.15 analyze the properties of sound waves and perform appropriate calculations; relate the physical properties of sound waves to the way sound is perceived.

AP.4.16 define Doppler shift and identify applications.

AP.4.17 apply ray optics diagrams to lenses and mirrors, use the lens/mirror equation and the magnification equation to solve optics problems.

AP.4.18 investigate and analyze optical applications in technology.

Electricity and Magnetism

AP.4.19 measure and draw electrical and magnetic fields; describe applications of electrical and magnetic fields.

AP.4.20 recognize the basic properties of electrical charge, charging by conduction and induction, and differentiate between conductors and insulators; calculate electrical force using Coulomb's law.

AP.4.21 recognize that circuits are closed loops; define units of electrical measure.

AP.4.22 construct and analyze electrical circuits and calculate Ohm's law problems for series, parallel and complex circuits including voltage drops; calculate power and energy in electrical systems.

Astronomy and Modern Physics

AP.4.23 describe the orbital relationships within the solar system; apply Kepler's Laws to calculate orbital periods.

AP.4.24 apply Newton's law of Universal Gravitation to derive relationships to calculate acceleration of gravity on other planets and orbital velocities.

AP.4.25 research and evaluate evidence of the Big Bang model of the universe.

AP.4.26 describe Einstein's special theory of relativity and its basic development through assumptions and logical consequences.

AP.4.27 describe nuclear reactions and discuss applications of nuclear energy.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

AP.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

AP.5.2 investigate and analyze the interdependence of science and technology.

AP.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

AP.5.4 describe the scientific concepts underlying technological innovations.

AP.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

AP.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

AP.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

AP.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

Physics-Technical Conceptual (11/12)
Content Standards and Objectives

Physics-Technical Conceptual (11/12) is a course designed for students who have completed Coordinated and Thematic Science Ten (CATS 10) and desire an in-depth study in physics to prepare them for technical careers. This course is an alternative to the traditional mathematical approach to physics. Curriculum organization and delivery for Physics-Technical Conceptual may be addressed by either of two approaches.

- **A thematic approach would cover the physics principles as applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. This approach would emphasize the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles.**

- **A topic approach would cover the physics principles in a traditional sequence with an emphasis on conceptual understanding. While mathematics is de-emphasized, laboratory work will require traditional physics measurements to be made. Emphasis will be on the concepts which underlie the natural laws of the universe.**

Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: History and the Nature of Science (SC.S.1)
Students will:

- demonstrate an understanding of the history of science and the evolvement of scientific knowledge;
- demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists; and
- demonstrate an understanding of the nature of science.

History and the Nature of Science Objectives
Students will:

PTC.1.1 formulate scientific explanations based on the student's observational and experimental evidence, accounting for variability in experimental results.
PTC.1.2 recognize that science has practical and theoretical limitations.
PTC.1.3 recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.
PTC.1.4 conclude that science is a blend of creativity, logic and mathematics.
PTC.1.5 trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.
PTC.1.6 integrate the history of science with cultural history to demonstrate that scientists work within their historical surroundings and are affected by them.

Standard 2: Science as Inquiry (SC.S.2)
Students will:

- demonstrate the abilities necessary to do scientific inquiry;
- demonstrate understanding about scientific inquiry; and
- demonstrate the ability to think and act as scientists

by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.

Science as Inquiry Objectives

Students will:

PTC.2.1 model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).

PTC.2.2 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).

PTC.2.3 apply scientific approaches to seek solutions for personal and societal issues .

PTC.2.4 properly and safely manipulate equipment, materials, chemicals, organisms and models.

PTC.2.5 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).

PTC.2.6 use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

PTC.2.7 demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).

PTC.2.8 design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).

Standard 3: Unifying Themes (SC.S.3)

Students will:

- demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change, and measurement; equilibrium and evolution; form and function);
- demonstrate the ability to identify, construct, test, analyze, and evaluate systems, models, and changes; and
- demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.

Unifying Themes Objectives

Students will:

PTC.3.1 analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.

PTC.3.2 apply evidence from models to make predictions about interactions and changes in systems.

PTC.3.3 measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.

PTC.3.4 understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).

Standard 4: Science Subject Matter/Concepts (SC.S.4)
Students will:

- demonstrate knowledge, understanding, and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives;
- demonstrate an understanding of the interrelationships among physics, chemistry, biology, and the earth and space sciences; and
- apply knowledge, understanding, and skills of science subject matter/concepts to daily life experiences.

Science Subject Matter/Concepts Objectives
Students will:

Mechanics

PTC.4.1 qualitatively and quantitatively analyze mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations).

PTC.4.2 use both given information and lab collected data to calculate velocity and acceleration along linear and circular paths.

PTC.4.3 draw free body diagrams to illustrate the forces acting on objects and perform simple calculations involving velocity, acceleration and net force; research the applications of force and acceleration in modern design and technology.

PTC.4.4 apply graphical and algebraic solutions to vector problems.

PTC.4.5 identify the relationship between potential energy and kinetic energy in gravitational and elastic potential/kinetic energy systems; recognize the conservation of energy in simple harmonic motion.

PTC.4.6 calculate work, energy, power and efficiency in mechanical systems.

PTC.4.7 construct models and/or working systems that show applications of technology to solve problems involving mechanical systems.

Fluids

PTC.4.8 qualitatively and quantitatively analyze fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations).

PTC.4.9 identify and apply the properties of solids, liquids and gases to explain their behavior at different pressures and temperatures.

PTC.4.10 identify and apply Bernoulli's principle to floating objects; identify the buoyant force acting on floating and submerged objects.

PTC.4.11 calculate the pressure of a solid object on a surface and the pressure exerted by a fluid at a given depth; relate the measure of pressure in kPapressure in N/m^2.

PTC.4.12 construct models and/or working systems that show applications of technology to solve problems involving fluid systems.

Thermodynamics

PTC.4.13 qualitatively and quantitatively analyze thermal systems (e.g., temperature, rate, resistance, energy).

PTC.4.14 perform conversions between Fahrenheit, Celsius, and Kelvin temperature scales.

PTC.4.15 define specific heat capacity; use the specific heat equation to calculate heat gained or lost during phase changes and heat lost when objects cool.

PTC.4.16 investigate and analyze the different rates of heat transfer by different materials.

PTC.4.17 construct models and/or working systems that show applications of technology to solve problems involving heat flow and heat exchange.

Waves, Sound and Optics

PTC.4.18 investigate and apply the reflective, refractive and diffractive properties of waves to study mechanical and electromagnetic waves.

PTC.4.19 use the relationship between wavelength, velocity and frequency to calculate the speed of waves; recognize that the speed of light is a constant.

PTC.4.20 construct models and/or working systems that show applications of technology to solve problems involving energy transfer by wave motion.

PTC.4.21 research and describe new developments in optical technology.

Electricity and Magnetism

PTC.4.22 qualitatively and quantitatively analyze electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations).

PTC.4.23 investigate the nature of electrical and magnetic fields; recognize the basic properties of electrical charge and differentiate between conductors and insulators.

PTC.4.24 draw and construct electrical circuits; apply Ohm's law to calculate

PTC.4.25 construct models and/or working systems that show applications of technology to solve problems involving use of electricity.

Modern Physics

PTC.4.26 recognize and distinguish between Einstein's General and Special Theories of Relativity and research evidences to support these theories.

PTC.4.27 recognize the products of nuclear decay and write decay chain equations. Voltage drops in series and parallel circuits.

Standard 5: Scientific Design and Application (SC.S.5)

Students will:

- demonstrate an understanding of the interdependence between science and technology;
- demonstrate the ability to distinguish between natural and man-made objects;
- demonstrate abilities of technological design; and
- demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.

Scientific Design and Application Objectives

Students will:

PTC.5.1 investigate, analyze, synthesize, and evaluate those devices in the home that were developed from the understanding of science and technology.

PTC.5.2 investigate and analyze the interdependence of science and technology.

PTC.5.3 apply scientific skills and technological tools to design solutions that address personal and societal needs.

PTC.5.4 describe the scientific concepts underlying technological innovations.

PTC.5.5 use appropriate technology solutions to measure and gather data; interpret data; analyze data; and to present and communicate conclusions.

Standard 6: Science in Personal and Social Perspectives (SC.S.6)

Students will:

- demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues;
- demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices;
- predict the long-term societal impact of specific health, population, resource and environmental practices; and
- demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.

Science in Personal and Social Perspectives Objectives

Students will:

PTC.6.1 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.

PTC.6.2 explore occupational opportunities in science and technology including the academic preparation necessary.

PTC.6.3 engage in decision making activities and actions to resolve science-technology-society issues.

SOCIAL STUDIES

Social Studies, as a field of study, embodies the essence of mankind and interconnects the past, present and future. It investigates where people live and how they participate as citizens. It manifests how they change, prosper and live in an increasingly culturally diverse, interconnected world. Social Studies, an academic area within the K-12 curriculum, is responsible for enabling students to understand the social world and become respectable citizens.

The West Virginia Content Standards and Objectives have been written in an effort to bring order to the vast, rich and powerful substance of social studies. With this philosophy as a guide, members of the Social Studies Curriculum Refinement Committee developed five content standards for all West Virginia students. Identifying what students should know and be able to do is the foundation of West Virginia's Content Standards and Objectives in Social Studies. As Abigail Adams wrote, "Learning is not attained by chance; it must be sought for with order and attended with diligence." Each content standard is a statement of a core learning expectation for all students.

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students have the opportunity to develop technology skills that support learning. Successful learning environments provide opportunities for students to use educational technology interwoven with relevant curricular content. West Virginia teachers are responsible for integrating technology appropriately in the students' learning environment.

The Social Studies Content Standards and Objectives establish the foundation of five core disciplines: citizenship, civics/government, economics, geography and history. Each discipline offers a distinct strategy for examining the world and providing students with specific intellectual and conceptual tools for analyzing causes and consequences. The organization of separate content standards for each discipline suggests their unique contribution to an understanding of the world; it does not imply they be taught in isolation. Social Studies is by its very nature integrative. The important social issues require insights from across the disciplines. Citizenship, civics/government, economics, geography and history each offer distinct approaches and develop specific skills for examining common subject matter, which can be integrated when addressing a particular issue or event. Below is a brief explanation of the specific importance of each core discipline.

Citizenship

Citizenship education will prepare students to become informed, active citizens who accept their responsibilities, understand their privileges and rights and participate actively in society and government as effective citizens. Students must be able to research issues, form reasoned opinions, support their positions and engage in the political process. The students will learn respect for the rights of others, a concern for the common good and a commitment to basic democratic principles.

Civics/government

Civics directly addresses citizenship education in the context of political systems. Students study the assumptions upon which governments are founded and the strategies governments employ to achieve their goals. With respect to the United States, students learn the underlying principles of representative democracy, the constitutional separation of powers and the rule of law. Students will understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. In order to develop these skills, the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Economics analyzes the production, allocation, distribution and use of resources. Students examine the inherent relationship between costs and benefits and the values associated with them. Understanding economic principles, whole economies and the interactions between different types of economies helps students comprehend the exchange of information, capital and products across the globe. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors and consumer decisions.

Geography

Geography organizes life situations in terms of where they occur. People interact with the natural world in culturally distinct ways to produce unique places, and those places change over time. The methods and perspectives of geography give students a spatial understanding of the world, and the ability to evaluate information in spatial terms. Students will examine the varying ways that peoples interact with their environments, and appreciate the diversity of the places those interactions create.

History

History organizes events and phenomena in terms of when they occurred and examines where, how and why they took place. Students study how individuals and societies have changed and interacted over time. They gather historical data, examine, analyze and interpret this data, and present their results in a clear, critical manner. They organize events through chronologies and evaluate cause-and-effect relationships among them. Students analyze how individuals, groups and nations have shaped cultural heritages. Through the study of history, students learn about states, nations, locations, settlements, formations, governments, economic developments and cultural history.

Plato informed our study of Social Studies when he wrote these words, "The direction in which education starts a man will determine his future life." Social Studies education must begin early to insure that students develop an understanding and appreciation of the United States as a powerful and proud nation. As we enter the twenty-first century, the United States remains an international leader and role model for democracy. Social Studies education is the heart and soul that provides students with the knowledge necessary to understand the strength and challenges of our country and the skills to make it even greater one day.

Social Studies Content Standards K-12

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

Kindergarten Social Studies Content Standards and Objectives

Social Studies in kindergarten will introduce children to the lives of interesting people in history, time sequence using historic events, geographic direction and economic choices. The Social Studies program begins the formal introduction of what constitutes a good citizen of the United States. Children will learn the roles of good citizens regarding responsibilities, privileges and rights. Teachers will emphasize the importance of following rules, respecting the rights of others, self-control, honesty, courage, justice and leadership. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.K.1.1 demonstrate an understanding that a good citizen takes turns and shares, takes responsibility for doing daily chores, cares for personal belongings and shows respect for what belongs to others.
SS.K.1.2 identify examples of honesty, courage and patriotism.
SS.K.1.3 identify the need for rules and the consequences for breaking rules and how to resolve disagreements peacefully.
SS.K.1.4 be given the opportunity to recite the Pledge of Allegiance, sing patriotic songs and celebrate national holidays.
SS.K.1.5 give examples and explain why citizens voluntarily contribute their time and talents to the community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.K.2.1 explain why rules are important and participate in developing rules.
SS.K.2.2 give examples of authority figures in the home, school and community.
SS.K.2.3 identify traditional patriotic symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as standing for the National Anthem.

Standard 3: Economics (SS.S.3)
Students will:
- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:
SS.K.3.1 identify occupations within the local community.
SS.K.3.2 identify the basic needs of people (shelter, food and clothing).
SS.K.3.3 identify the economic concept of the difference between needs and wants.
SS.K.3.4 identify the economic concept of the exchange of money for goods and services.
SS.K.3.5 identify the economic concept of saving for the future.
SS.K.3.6 recognize that some goods and services are provided by the government (schools, parks, police and fire departments).

Standard 4: Geography (SS.S.4)
Students will:
- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:
SS.K.4.1 identify land masses versus bodies of water using a globe or a map.
SS.K.4.2 demonstrate knowledge of left/right, up/down, near/far and above/under using locations on a map or picture.
SS.K.4.3 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities).
SS.K.4.4 name the four seasons and describe the characteristics of each season.
SS.K.4.5 name types of weather, describe the characteristics of each type, and describe what people wear in different types of weather.
SS.K.4.6 compare and contrast characteristics of life in the city (urban) and country (rural).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.K.5.1 collect data and sequence time, places, people and events as they relate to the student's own life.
SS.K.5.2 build a sense of empathy toward other people, times and cultures.
SS.K.5.3 begin to identify sources of information to answer questions.
SS.K.5.4 explore the past through stories of people, heroes, pictures, songs, holidays, customs, traditions and legends.
SS.K.5.5 investigate the culture of Native Americans.
SS.K.5.6 identify characteristics of communities, families and family life.

First Grade Social Studies Content Standards and Objectives

Social Studies in grade one explores the role of the citizen in the schools, family, and community. Students will learn responsibilities, privileges and rights, patriotic traditions, symbols, functions of money and the connection of the past to the present. Conflict resolution, consumer roles and good safety practices will be introduced. Students will be introduced to geographic features and regions. A variety of graphic skills will be incorporated, including graphs, charts, timelines and other data collection activities. Economic concepts of basic needs and community occupations will be explored. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-3 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.1.1.1 express opinions and accept opinions of others in solving problems and/or resolving conflicts.
SS.1.1.2 recognize examples of honesty, caring and trustworthiness in the home and at school.
SS.1.1.3 participate in developing classroom rules and identifying consequences of breaking rules.
SS.1.1.4 demonstrate respect and responsibility for self and others' materials and belongings.
SS.1.1.5 be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing and celebrate national holidays.
SS.1.1.6 explain volunteerism and participate in school/community projects.
SS.1.1.7 demonstrate and give examples of appropriate behavior in dangerous situations (e.g., fire, poison, traffic, strangers and drugs.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/ Government Objectives
Students will:

SS.1.2.1 identify and practice various group roles (e.g., group leader, recorder, reporter, collector) in the classroom.
SS.1.2.2 explain why different forms of governments (e.g., family, school, communities) are necessary.
SS.1.2.3 describe the roles of government leaders and identify the president and governor.
SS.1.2.4 recognize the need for authority figures.
SS.1.2.5 explain the difference between rules and laws, establish criteria for determining if a rule or law is fair, and identify the consequences for breaking rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.1.3.1 make choices from among needs and wants, and predict the consequences of those choices.

SS.1.3.2 demonstrate the exchange of goods and services (using money or other goods and services).

SS.1.3.3 compare and contrast occupations in the community.

SS.1.3.4 recognize that all people share the same basic needs.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, analyze and explain how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of the environment and society (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.1.4.1 construct a simple map of a familiar area (such as the school) incorporating cardinal directions and map symbols.

SS.1.4.2 locate the United States and West Virginia on a globe or world map.

SS.1.4.3 identify major geographic features (e.g., rivers, lakes, mountains, oceans) using a United States map.

SS.1.4.4 sequence the seasons of the year, days of the week and months.

SS.1.4.5 identify basic natural resources (e.g., water, plants, soil, air).

SS.1.4.6 describe how climate/weather affects the way people live (e.g., food, clothing, shelter, recreation).

SS.1.4.7 construct and interpret simple maps using cardinal directions, location, a scale and symbols in a legend.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.1.5.1 identify ways communities change over time (e.g., landscape, buildings, jobs, population).

SS.1.5.2 investigate and contrast family history through two generations (parents, grandparents) and make comparisons to present-day living using sources such as timelines, interviews, pictures and graphs.

SS.1.5.3 identify characteristics of the past and contributions of heroic people using sources as stories, folk tales, pictures, poems, songs, legends, holidays and customs.

SS.1.5.4 build a sense of empathy for others by investigating racial and cultural differences through celebrations, holidays and family traditions.

SS.1.5.5 identify different types of families (e.g., single parent, extended, multi-generational).

SS.1.5.6 participate in the collection and organization of historical data.

Second Grade Social Studies Content Standards and Objectives

Second grade Social Studies expands the roles of citizenship. Students will learn the functions of government, local folklore, symbols and traditions. The roles and responsibilities of each child as a citizen in a democratic community and nation will be emphasized. They will explore volunteer and service activities, conservation and environmental preservation. The use of conflict resolution will be reinforced. Students will continue to learn about geographic places and regions and participate in map activities. Students will learn the economic concepts of needs/wants, bartering and saving/spending. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.2.1.1 choose and participate in a project of volunteer service.

SS.2.1.2 identify and examine examples of honesty, trustworthiness, compassion and empathy in daily life experiences.

SS.2.1.3 model the personal responsibilities of good citizenship in the classroom (e.g., responsibility, self-control).

SS.2.1.4 be given the opportunity to recite the Pledge of Allegiance and participate in national celebrations.

SS.2.1.5 identify and practice components of conflict resolution within the school community.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.2.2.1 identify the three levels of government (local, state, federal).
SS.2.2.2 compare and contrast rules and laws.
SS.2.2.3 recognize the need for authority figures and identify the characteristics of responsible leaders.
SS.2.2.4 explain how and why laws/rules can provide order and predictability.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.2.3.1 make economic choices and predict the consequences of those choices.
SS.2.3.2 explore various occupations and how job opportunities in the community have changed.
SS.2.3.3 practice bartering as an alternative method of securing goods/services and needs/wants, and compare to present ways of acquiring goods and services.
SS.2.3.4 identify how people in different cultures have the same needs, but meet their needs in different ways.
SS.2.3.5 explain the role of banks in saving for the future purchase of goods and services.
SS.2.3.6 construct, read and interpret a variety of graphs, charts and tables.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.2.4.1 recognize West Virginia by shape and relative location.
SS.2.4.2 demonstrate knowledge of cardinal directions, a compass rose and map legends on a map.
SS.2.4.3 identify the United States and/or world regions on a map.
SS.2.4.4 examine a variety of maps and globes to identify and describe major geographic features (e.g., rivers, lakes, oceans, islands, continents, mountains).
SS.2.4.5 identify basic natural resources (e.g., water, plants, soil, air) and how people use these resources.
SS.2.4.6 locate major communities in the county and state, and explain the processes that have caused them to change.
SS.2.4.7 use a map scale to construct class and school maps.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.2.5.1 gather information and data using family artifacts, photos and interviews in order to compare different life styles, and use this information to construct a timeline of family history through three generations.
SS.2.5.2 explore the history of the community by identifying locally significant sites and people.
SS.2.5.3 explore, compare and contrast the past contributions of heroic people using sources such as stories, folk tales, pictures, poems, songs, legends, holidays and customs.
SS.2.5.4 investigate current events using various media (e.g., student newspaper, television, news broadcasts).
SS.2.5.5 read children's books about different cultures, and compare the variety of traditions, languages, structures of families and community life.
SS.2.5.6 examine the lives and cultures of Native Americans and early settlers through stories, legends, myths and folklore.
SS.2.5.7 use and draw conclusions from various historic data collection methods (e.g., graphs, charts, timelines).

Third Grade Social Studies Content Standards and Objectives

Third grade Social Studies presents a study of the broader community to introduce state and nation. Students will explain community changes due to technology, human interaction with the environment and the movement of people. Students will practice citizenship in the school and community and study government at local, state and national levels. Supply and demand, taxation and budgeting within the context of the community will be introduced. The objectives for elementary West Virginia Social Studies may be integrated throughout the K-4 curriculum. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.3.1.1 identify and practice principles of honesty, fairness and justice in experiences at home, school and in the community.
SS.3.1.2 identify and model the personal and civic responsibilities of good citizenship in the classroom, school and community.
SS.3.1.3 explain the significance of patriotic symbols, holidays, celebrations and famous people.
SS.3.1.4 explain the importance of respect and protection of minorities.
SS.3.1.5 give examples of how people working together can accomplish goals that individuals working alone cannot.
SS.3.1.6 explain and cite examples of how groups can make a difference in the community.
SS.3.1.7 introduce the concept of the common good.

Performance Descriptors (SS.PD.3.1)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate how the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state are important for the common good and predict situations where students will use these responsibilities.
- **Mastery**
  Third grade students performing at the mastery level explain and demonstrate the responsibilities of citizenship, such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.
- **Partial Mastery**
  Third grade students performing at the partial mastery level recognize, recall, and label the responsibilities of citizenship such as honesty, justice, patriotism, and respect at school, at home, in the community and in the state.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:

SS.3.2.1 explain the importance of government in the classroom, school, community and state.
SS.3.2.2 explain that citizens are united by commonly held principles and beliefs.
SS.3.2.3 identify the three levels (local, state, federal) of government and the responsibilities of each level.
SS.3.2.4 review majority rule and give examples of that concept in a democracy.
SS.3.2.5 apply criteria in evaluating rules and laws (strengths and weaknesses, design and purpose, enforcement, bias).

Performance Descriptors (SS.PD.3.2)

- **Distinguished**
  Third grade students performing at the distinguished level analyze government in order to determine its importance in the classroom, school, community and state. They evaluate school rules. They describe majority rule as it relates to democracy.
- **Mastery**
  Third grade students performing at the mastery level explain government and its importance in the classroom, school, community and state. They compare and contrast school rules/laws as to their strengths and weaknesses. They relate majority rule to that concept in a democracy.
- **Partial**
  Third grade students performing at the partial mastery level define government and identify its importance in the classroom, school, community and state. They identify classroom rules.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.3.3.1 explain the concept of scarcity by citing examples of limited supplies and scarce resources.
SS.3.3.2 explain why budgeting is a critical skill.
SS.3.3.3 explain supply and demand with appropriate examples.
SS.3.3.4 examine the economic impact of various occupations.
SS.3.3.5 summarize how banks serve as intermediaries between savers and borrowers.
SS.3.3.6 explain the relationship between government taxation and the provision of public services.
SS.3.3.7 illustrate the path of a product from the raw material to the consumer.
SS.3.3.8 show how competition for products increases with advertising.
SS.3.3.9 create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products and the supply of goods and services.

Performance Descriptors (SS.PD.3.3)

- **Distinguished**
  Third grade students at the distinguished level classify how budgeting and occupational choices change because of scarcity, production, consumption and taxation on the occupations and budgets of people, and the provisions of public services.
- **Mastery**
  Third grade students at the mastery level explain within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services and advertising affect personal budgeting and occupational choice.
- **Partial Mastery**
  Third grade students at the partial mastery level define within the context of the community scarcity, supply, demand, savings, taxation, steps in production, consumption, public services, advertising, personal budgeting and occupational choice.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.3.4.1 describe and use the basic elements of maps and globes (e.g., title, legend, cardinal directions, scale, grid, parallels, meridians).
SS.3.4.2 identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles and time zones using a map.
SS.3.4.3 identify world geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, oases).
SS.3.4.4 locate states and capitals on a United States map.
SS.3.4.5 compare and contrast climate, weather and location with regard to people's clothing, food, shelter and jobs.
SS.3.4.6 describe the various elements of the environment (water, soil, weather, climate, topography), and explain how people affect and are affected by them.
SS.3.4.7 describe how people in the community make their living from the environment and identify activities that individuals can do to keep the environment clean.

SS.3.4.8 construct, read and interpret data from various types of maps, globes, charts, graphs and timelines (e.g., population, products, climate).

Performance Descriptors (SS.PD.3.4)

- **Distinguished**
  Third grade students performing at the distinguished level identify and explain the elements of maps and globes and define geographic vocabulary, use a wide variety of maps and globes to locate major world geographic features, and analyze the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Mastery**
  Third grade students performing at the mastery level identify the basic elements of maps and globes and define geographic vocabulary, use a variety of maps and globes to locate major world geographic features, and describe the interaction between people and environment with regard to personal directions, latitude and longitude, states and capitals.
- **Partial Mastery**
  Third grade students performing at the partial mastery level sometimes identify the basic elements of maps and globes and define simple geographic vocabulary. Students use simple maps and globes to locate major world geographic features. Sometimes they recognize the interaction between people and environment with regard to personal direction, states and capitals.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.3.5.1 explain the historical significance of major events, people and their contributions to the United States.
SS.3.5.2 construct a timeline representing the settlement of a community/region.
SS.3.5.3 compare and contrast present cultures to the cultures of people of other historical time periods (e.g., source of food, clothing, shelter, products used).
SS.3.5.4 make historical inferences by analyzing artifacts and pictures.
SS.3.5.5 discuss and draw conclusions about current events.
SS.3.5.6 explore American heroes, customs and traditions using various forms of literature.
SS.3.5.7 explain the importance of respect for diversity in the heritage, culture, ideas and opinions of others.
SS.3.5.8 compare and contrast different stories or accounts about past events, people, places or situations, and identify how they contribute to our understanding of the past.
SS.3.5.9 sequence and discuss a series of pictures that reflect historic change (e.g., transportation, technology, agriculture, events in history).
SS.3.5.10 organize information from various reference sources to prepare short reports and presentations.

Performance Descriptors (SS.PD.3.5)

- **Distinguished**
  Third grade students performing at the distinguished level evaluate the significance of key individuals and major historical events in early American history. Using folklore and literature, they draw conclusions about lifestyles and cultures. Students describe their local community and extend the concept of community to state, nation and the world.
- **Mastery**
  Third grade students performing at the mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they compare and contrast past and present cultures. Students describe their local community and extend the concept of community to state and nation.
- **Partial Mastery**
  Third grade students performing at the partial mastery level identify key individuals and major historical events in early American history. Using folklore and literature, they list characteristics of cultures past and present. Students describe their local community.

Fourth Grade Social Studies Content Standards and Objectives

Fourth grade Social Studies is an introduction to the growth of the United States from exploration and colonization (When The Three Worlds Meet) to the conclusion of the American Revolution. Students will analyze the assimilation of immigrant groups, development of improved technology, major historical figures and events. Students will also learn about the physical geography of North America and its influence upon diverse cultures. Data collection and the essential roles of citizens in the democratic process will be emphasized. Roles of elected officials, economic trade offs and the need for taxation will be introduced. Students will learn how the economic concepts of competition, advertising, budgeting and taxation impact production and consumption. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.4.1.1 identify public agencies in the community that provide services and investigate opportunities for volunteerism.
SS.4.1.2 work independently and cooperatively to accomplish goals.
SS.4.1.3 identify commonly held democratic values, principles and beliefs expressed in the Declaration of Independence and the significance of patriotic symbols, holidays, celebrations and famous people.

SS.4.1.4 describe forms of diversity in early American society, giving examples of the strengths/contributions of each.
SS.4.1.5 evaluate the qualities of responsible leadership by individuals and in groups.
SS.4.1.6 explain the responsibilities, privileges and rights of United States citizenship and the importance of civic life.
SS.4.1.7 describe ways in which groups of people in schools/communities can manage conflict peacefully.

Performance Descriptors (SS.PD.4.1)

- **Distinguished**
  Fourth grade students performing at the distinguished level explain the basic democratic values, principles, and beliefs expressed in the Declaration of Independence and analyze how they relate to rights and responsibilities of Americans today, and then, find examples of them in today's news and activities. They assess and critique the significance of US and WV patriotic symbols, holidays and celebrations. They generate strategies which will enhance conflict resolution skills.
- **Mastery**
  Fourth grade students performing at the mastery level compare and contrast the principles, values and beliefs expressed in the Declaration of Independence, and draw conclusions about the significance of US and WV patriotic symbols, holidays and celebrations. They also describe the rights and responsibilities of American and WV citizenship and then employ strategies to manage conflict peacefully.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level name some of the principles, values and beliefs expressed in the Declaration of Independence and summarize some significances of the US and WV patriotic symbols, holidays and celebrations. They also identify the rights and responsibilities of American and WV citizenship and then model strategies for managing conflict peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.4.2.1 explain how the rule of law and limited government protect individual rights and the common good.
SS.4.2.2 explain the rights of minorities in the democratic process and the right to dissent responsibly.
SS.4.2.3 identify historical conflicts concerning individual rights and how those conflicts were resolved.

Performance Descriptors (SS.PD.4.2)

- **Distinguished**
  Fourth grade students performing at the distinguished level verify the protection of minority rights in a democracy, cite examples of conflicts concerning individual rights and draw conclusions about how they have been resolved. They analyze symbols and celebrations and rank famous West Virginians according to the significance of their contributions. They compare and contrast the parts of government at the local, county and state levels.
- **Mastery**
  Fourth grade students performing at the mastery level explain how the rights of minorities are protected in a democracy and how conflicts concerning individual rights have been resolved. They explain state symbols, celebrations and famous West Virginians and describe their contributions. They define parts of the government at the local, county and state levels.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level list examples of how the rights of minorities are protected in a democracy. They recall how conflicts concerning individual rights have been resolved. They identify state symbols, celebrations and famous West Virginians. They list the parts of the government at the local, county and state levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.4.3.1 explain the concept of trade-offs (e.g., developing hypothetical budgets in simulated situations).
SS.4.3.2 using print and media sources, analyze advertisements and their impact upon consumer choices.
SS.4.3.3 analyze the factors that shaped the economy in the colonies and the Americas.
SS.4.3.4 give examples of people as consumers and producers of goods.
SS.4.3.5 explain the concept of taxation and its relationship to public services.
SS.4.3.6 describe how slavery and indentured servitude influenced the early economy of the United States.
SS.4.3.7 predict how competition in the market place affects prices.
SS.4.3.8 analyze a product chart for price comparison.
SS.4.3.8 construct and use charts, graphs, tables and grids to display data.

Performance Descriptors (SS.PD.4.3)

- **Distinguished**
  Fourth grade students at the distinguished level analyze the factors of production, scarcity, land use, consumer and producer choices and explain their impact on taxation, slavery, indentured servitude and natural resources in the economic development of the colonies and the Revolutionary War. Students explain how occupational choices are affected by resource use.

- **Mastery**
  Fourth grade students at the mastery level identify the factors of production, scarcity, land use, choices of consumers and producers of goods and explain their impact on taxation, slavery, indentured servitude and natural resources to explain the economic development of the colonies and the American Revolution. Students identify how natural resources and geographic features affect the economic development of West Virginia and the occupational choices of citizens.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level define factors of production, scarcity, land use and taxation and cite an example of each. Students identify occupations based on the natural resources and geographic features of West Virginia.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.4.4.1 identify and locate North, South and Central American countries and bodies of water.
SS.4.4.2 use geographic terms to describe the physical features of the Americas (e.g., mountains, rivers, grasslands, oases).
SS.4.4.3 analyze the effect of geographic factors in the development of transportation routes and settlement patterns in the Americas.
SS.4.4.4 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky mountains, Great Plains, Rain Forest, Isthmus of Panama).
SS.4.4.5 compare and contrast the physical, economic and political changes caused by geographic conditions and human intervention.
SS.4.4.6 analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services and interaction with the outside world.
SS.4.4.7 identify geographic factors that affect population density and other patterns on the earth.
SS.4.4.8 describe different climate types.
SS.4.4.9 locate on a map the sites of the American Indian nations before the arrival of the Europeans.
SS.4.4.10 utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers).

Performance Descriptors (SS.PD.4.4)

- **Distinguished**
  Fourth grade students performing at the distinguished level independently identify and locate the countries of the Americas, states of the United States and counties of West Virginia on blank maps. The students use grade level terminology in drawing conclusions about the interaction of people and environment of West Virginia and the United States in regard to physical features, natural resources, climate, transportation, migration and settlement. They compare, contrast and analyze regions of both West Virginia and the United States.
- **Mastery**
  Fourth grade students performing at the mastery level identify and locate the countries of Americas, states of the United States and the counties of West Virginia on blank maps. The students use grade level geographic terminology to describe the interaction of people and the environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They compare and contrast regions of both West Virginia and the United States.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level locate some of the countries of the Americas, states of the United States and the counties of West Virginia on blank maps, and define simple geographic terms, recognize the interaction of people and environment of West Virginia and the United States with regard to physical features, natural resources, climate, transportation, migration and settlement. They locate selected regions of both West Virginia and the United States.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.4.5.1 interpret data presented in timelines.

SS.4.5.2 order chronologically selected historical figures and episodes, and explain their importance in the stories of Native Americans, explorers, settlers and colonists in North America.

SS.4.5.3 identify major leaders and events from America's colonization through the Revolutionary War.

SS.4.5.4 identify the influence of various factors on the founding of the original colonies.

SS.4.5.5 identify areas and patterns of early American settlement and depict territorial expansion and population distribution in the United States through maps, charts, pictures and research projects.

SS.4.5.6 explore ways in which early explorers and settlers adapted to, used and changed the environment of the state or region.

SS.4.5.7 identify and describe European explorers of the 15th and 16th centuries, their reasons for exploring, the information gained from their journeys and what happened as a result of their travels.

SS.4.5.8 explore how and why family and community life differed in various regions of colonial North America.

SS.4.5.9 compare the family lives of different groups and strata in colonial times including the roles and responsibilities of men, women, children and the elderly.

SS.4.5.10 explain how African Americans came to America and how slavery developed.
SS.4.5.11 describe factors that led to the colonists' break with Great Britain and research major events of the Revolutionary War (e.g. Stamp Act, Boston Tea Party, Bunker Hill, Yorktown)
SS.4.5.12 describe ways in which language, stories, music, folk tales and artistic creations serve as expressions of culture and influence the behavior of people living in a particular culture.
SS.4.5.13 compare and contrast the cultures of the colonists and Native Americans and describe the changes that occurred when they came into contact with one another.
SS.4.5.14 explain the similarities and differences in backgrounds, motivations and occupational skills between people in the English settlements and those in the French and Spanish settlements.
SS.4.5.15 evaluate the choices made and roles undertaken in the American Revolution by different classes and groups and what they hoped or feared from revolution.
SS.4.5.16 analyze various sources for reconstructing the past such as documents, letters, diaries, maps, photos and others.
SS.4.5.17 explain why Americans and those who led them (e.g., George Washington, Benjamin Franklin, Thomas Jefferson) went to war to win independence from England.
SS.4.5.18 analyze and interpret information from pictures and news sources related to historical events and people.
SS.4.5.19 suggest appropriate reference sources to answer specific questions, collect information and prepare short reports.
SS.4.5.20 sequence major historical events in United States history on a timeline (e.g., discovery of America, Boston Tea Party, Revolutionary War).

Performance Descriptors (SS.PD.4.5)

- **Distinguished**
  Fourth grade students performing at the distinguished level connect early exploration and colonization of North America to the spread of cultural, religious and political ideology. They assess the significant events and differing beliefs leading to the Revolutionary War. Students use primary and secondary sources to draw conclusions about colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Mastery**
  Fourth grade students performing at the mastery level explain the early exploration and colonization of North America. Students identify significant events leading to the Revolutionary War. They use primary and secondary sources to describe colonial life. Students trace and describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.
- **Partial Mastery**
  Fourth grade students performing at the partial mastery level trace and describe the early exploration and colonization of North America. Students identify key events leading to the Revolutionary War. They describe the economic, social, political and cultural history of West Virginia as reflected in folklore and heritage.

Elementary West Virginia Studies Content Standards and Objectives

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives shall be taught as a kindergarten-4 integrated unit or as a separate fourth grade unit. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation. Teachers are encouraged to introduce students to geographic places and regions. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
The students will:

SS.WV.1.1 explain why various civic dispositions, such as the act of voting as a West Virginia citizen, is a responsibility, a privilege and a right.
SS.WV.1.2 propose solutions and investigate opportunities for public volunteerism concerning a local problem.
SS.WV.1.3 explain that students are citizens of their classroom, community, state and nation.
SS.WV.1.4 take and defend a position as to why fulfilling one's civic responsibility is important.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
The students will:

SS.WV.2.1 identify state symbols, the state capital, the Governor, celebrations, holidays and famous West Virginians.

SS.WV.2.2 recognize and be given the opportunity to recite the State Motto and sing the State Song.

SS.WV.2.3 identify the roles and functions of the government (e.g., legislative, executive, judicial branches) at the local, county and state levels.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
The students will:

SS.WV.3.1 identify the effect of natural resources and geographic features upon the economic development of counties and the state.

SS.WV.3.2 identify the major occupations of people in the private and public sectors of our state.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.WV.4.1 locate West Virginia on a United States map, and identify bordering states.

SS.WV.4.2 locate and describe the four geographic regions of West Virginia and the major communities contained within each region.

SS.WV.4.3 locate student's county and county seat on a West Virginia map.

SS.WV.4.4 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services and interaction with the outside world and changes over time.

SS.WV.4.5 describe West Virginia's climate and weather.

SS.WV.4.6 recognize the difference between renewable and nonrenewable resources.

SS.WV.4.7 identify s tudent's state, town, county and address.

SS.WV.4.8 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests and scenic/recreational resources.

SS.WV.4.9 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, mountain ranges).

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.WV.5.1 explain and trace the economic, social and political history of West Virginia.
SS.WV.5.2 describe the cultural life of West Virginia as reflected in folklore and heritage.
SS.WV.5.3 compare and contrast past and present lifestyles of West Virginians.
SS.WV.5.4 use reference sources to answer specific questions, collect information and prepare short reports about West Virginia.

Fifth Grade Social Studies Content Standards and Objectives

The fifth grade Social Studies program is a basic overview of the United States from its emergence as a new nation. Students will understand the significance of major events of each historical era. Students will examine documents relating to the establishment of the nation and the new government. They will continue to examine the role of citizenship in the school and community. Students will examine the movement in the nation from rural to urban and from agriculture to industry focusing on the economic impact of these moves. Students will learn how government decisions impact the economy. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:
SS.5.1.1 describe how groups and institutions work to meet the individual needs and promote the common good.
SS.5.1.2 explain the political process and describe its importance in decision-making.
SS.5.1.3 explain the consent of the governed as the source of authority of government.
SS.5.1.4 explain the importance of citizens' having and supporting common democratic values and principles expressed in the nation's core documents.
SS.5.1.5 identify and analyze differences between individual responsibilities, privileges and rights of American citizenship.

Performance Descriptors (SS.PD.5.1)

- **Distinguished**
  Fifth grade students performing at the distinguished level justify and defend the roles of an American citizen in relation to responsibilities, rights, involvement in political process and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Mastery**
  Fifth grade students performing at the mastery level identify, explain, and examine the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and analyze the belief in common values and principles as defined by our core documents.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level recognize and recall some of the roles of an American citizen in relation to responsibilities, rights, involvement in political process, and decision making. They explain the source of governmental power and the belief in common values and principles as defined by our core documents.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives
Students will:
SS.5.2.1 give examples of how government does or does not provide for the needs and wants of people, establish order and manage conflict.
SS.5.2.2 participate in exercises that demonstrate knowledge of trial by jury.
SS.5.2.3 list and explain the weaknesses of the Articles of Confederation.
SS.5.2.4 list the individual rights and responsibilities in the Bill of Rights.
SS.5.2.5 identify the first three articles of the Constitution and outline the basic functions of the three branches of government.
SS.5.2.6 explain and illustrate how a bill becomes a law.
SS.5.2.7 analyze the importance of government in the classroom, school, community, state and nation.

Performance Descriptors (SS.PD.5.2)

- **Distinguished**
  Fifth grade students performing at the distinguished level compare and contrast the Articles of Confederation, U.S. Constitution and Bill of Rights to determine how each meets the needs and wants of the people. They create a bill to address a particular need or want and work through the legislative process.
- **Mastery**
  Fifth grade students performing at the mastery level explain how government does or does not provide for the needs and wants of the people, (e.g., the failure of the Articles of Confederation, the development of the Constitution and the Bill of Rights). They describe the steps taken for a bill to become law and recognize that laws evolve to meet the needs and wants of the people.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify some needs and wants of the people that government provides/addresses, and list the basic rights in the Bill of Rights. They will identify laws at the local, state and national levels.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.5.3.1 identify the roles of consumers in the United States economy.
SS.5.3.2 apply the concept of supply and demand to a specific United States situation.
SS.5.3.3 explain the economic impact of slavery upon the development of the United States.
SS.5.3.4 list geographic factors that can enhance or limit economic activities in various United States regions.
SS.5.3.5 describe the impact of industrialization on the economy of the United States.
SS.5.3.6 explain the function of agriculture in the economic development of the United States.
SS.5.3.7 apply the concepts of sales, expenses and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines).

Performance Descriptors (SS.PD.5.3)

- **Distinguished**
  Fifth grade students at the distinguished level construct possible solutions for a selected long-term economic problem that was present through the nineteenth and twentieth centuries and construct a model showing possible solutions.
- **Mastery**
  Fifth grade students at the mastery level explain the role of economic factors, agriculture, slavery, industrialization, supply and demand and competition, in the development of the United States economy and individual consumer habits from the emergence of a new nation to the present.
- **Partial Mastery**
  Fifth grade students at the partial mastery level describe examples of economic factors, agriculture, slavery, industrialization, supply and demand, and competition, which have influenced United States economy from the Revolutionary War to the present.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.5.4.1 read, interpret and draw conclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, timelines).
SS.5.4.2 measure distances using a scale, and apply the concept of cardinal and intermediate directions.
SS.5.4.3 use a map to locate a country by hemisphere and its proximity to the equator.
SS.5.4.4 locate, identify and contrast the major rivers, landforms, natural resources, climate regions, major soil regions and deserts of the United States.
SS.5.4.5 describe the development of the United States' urban areas.
SS.5.4.6 discuss and define the various regions of the United States.
SS.5.4.7 identify and locate each of the fifty United States within their regions.
SS.5.4.8 explain the relationship of the environment to cultures in the United States.
SS.5.4.9 relate the United States' westward expansion to natural resources and physical geography.
SS.5.4.10 use geography to describe historical events.
SS.5.4.11 describe how people have changed the environment of the United States.

Performance Descriptors (SS.PD.5.4)

- **Distinguished**
  Fifth grade students performing at the distinguished level use, construct and draw conclusions from U.S. maps and other resources, and acquire, process and effectively report on the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze and evaluate how human activity and environment shaped the United States, and use and apply geographic perspective and tools to discuss the evolution of cultures in the United States.
- **Mastery**
  Fifth grade students performing at the mastery level use and acquire information from United States maps and other resources. They discuss the various regions of the United States from the early explorers' perception to current times. They explain the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and analyze how human activities and the environment shaped the United States.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level relate information from United States maps and resources, and identify the various regions of the United States from the perceptions of the early explorers to the current times. They discuss the physical processes responsible for the major rivers, mountains, soils and deserts of the United States, and identify human activities and environment that shaped the United States. Students use simple geographic tools to explain evolution of cultures in the United States.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives
Students will:

SS.5.5.1 describe and analyze the events and the historic figures responsible for such documents as the United States Constitution, the Bill of Rights and the Emancipation Proclamation.

SS.5.5.2 create a timeline showing the arrival of major immigrant groups and describe their experiences and the influence of each culture upon American society.

SS.5.5.3 describe the development of transportation in the United States and explain its impact on settlement, industry and residential patterns.

SS.5.5.4 explain why maintaining historical records and landmarks is important to the United States.

SS.5.5.5 interpret quotes of famous Americans from various periods of history.

SS.5.5.6 explain how important figures reacted to their times and why they were significant to the history of our democracy (e.g., George Washington, Thomas Jefferson, Abraham Lincoln, Sojourner Truth, Susan B. Anthony, Eleanor Roosevelt and Martin Luther King, Jr.).

SS.5.5.7 describe how regional folk heroes and other popular figures have contributed to the cultural history of the United States (e.g., frontiersmen such as Daniel Boone, cowboys, mountain men such as Jedediah Smith, American Indian Chiefs including Geronimo and outlaws such as Billy the Kid).

SS.5.5.8 explain how songs, symbols and slogans demonstrate freedom of expression and the role of protest in democracy (e.g., the abolition of slavery, women's suffrage, labor movements, the civil rights movement).

SS.5.5.9 assess the significance of the new Constitution of 1787, including the struggles over its ratification and the reasons for the addition of the Bill of Rights.

SS.5.5.10 describe issues faced by Washington when he became the first United States President.

SS.5.5.11 identify and explain social and technological changes that took place during the Industrial Revolution in the United States.

SS.5.5.12 list the reasons for westward expansion and explain how it affected the inhabitants of the American West (e.g., Native Americans).

SS.5.5.13 explain the effects of government policies on Native American nations and their land holdings.

SS.5.5.14 analyze the impact of slavery and the Abolitionist Movement upon the development of the United States.

SS.5.5.15 identify causes, major events and important people of the Civil War.

SS.5.5.16 explain how various reconstruction plans succeeded or failed.

SS.5.5.17 identify events which led to the United States becoming a world power.

SS.5.5.18 identify the opposing sides in World War I and explain why the United States entered the war.

SS.5.5.19 describe the effects of the Great Depression on the people of the United States.

SS.5.5.20 identify the causes and effects of World War II.

SS.5.5.21 identify significant leaders in the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson).

Performance Descriptors (SS.PD.5.5)

- **Distinguished**
  Fifth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context from the post-Revolutionary War era to the present. They determine factors which led to the ascent of the United States to a world power and analyze the role of the United States in significant nineteenth and twentieth century events.
- **Mastery**
  Fifth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context from the post - Revolutionary War era to the present. They explain the ascent of the United States to a world power and describe significant nineteenth and twentieth century events.
- **Partial Mastery**
  Fifth grade students performing at the partial mastery level identify key people, places, documents, ideas, and events in their correct historical period and context from the post -Revolutionary War era to the present.

Sixth Grade Social Studies Content Standards and Objectives

Sixth grade Social Studies provides an interdisciplinary examination of selected world regions: North America, South America, Western Europe and the Middle East. Students study historical development, characteristics of places, connections between regions and their impact on modern cultures. Students learn how governments are developed and the roles of citizens in various emerging state/nation. Emphasis will be placed on how environment, technology and resources have helped to determine economic relations and conflicts between these regions. Various economic systems will be introduced. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.6.1.1 describe ways in which nations interact with one another and try to resolve problems.
SS.6.1.2 evaluate, take and defend positions on the purposes that government should serve.
SS.6.1.3 explain how nations benefit when they resolve conflicts peacefully.
SS.6.1.4 compare and contrast the role of American citizens and citizens in selected regions.
SS.6.1.5 analyze and evaluate the influence of various forms of citizen action on public policy.
SS.6.1.6 evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision making.

SS.6.1.7 compare and contrast responsibilities, privileges and rights of United States citizenship in selected regions.

Performance Descriptors (SS.PD.6.1)

- **Distinguished**
  Sixth grade students performing at the distinguished level predict how the roles of American citizens and citizens in other nations may change in the future and assess the influence of those citizens' actions on public policy. They also judge and defend the benefits of resolving international conflicts peacefully.
- **Mastery**
  Sixth grade students performing at the mastery level compare and contrast the roles of American citizens to citizens in other nations and analyze the influence of those citizens' actions on public policy. They also survey the benefits of resolving international conflicts peacefully.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the roles of citizens in world regions and identify some of the influences of those citizens' actions on public policy. They also demonstrate some of the benefits of resolving international conflicts peacefully.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.6.2.1 evaluate competing ideas about the purposes of government.
SS.6.2.2 analyze and explain how various types of government meet needs and wants of citizens, manage conflict and establish security.
SS.6.2.3 explain the impact of strong leadership on historic world events.
SS.6.2.4 explain the purpose of political parties and special interest groups and their influence on the political process.
SS.6.2.5 illustrate the political divisions of nations.
SS.6.2.6 identify and give examples of different forms of government, and classify them as either limited or unlimited.
SS.6.2.7 distinguish between governmental and nongovernmental international organizations and describe their functions.

Performance Descriptors (SS.PD.6.2)

- **Distinguished**
  Sixth grade students performing at the distinguished level analyze various forms of governments and they compare the structures of governments for the power given to leaders. They identify strong leadership and evaluate their actions and the consequences. They determine the function of governmental and non-governmental organizations.

- **Mastery**
  Sixth grade students performing at the mastery level explain the impact of strong leadership on historical world events. They differentiate among various forms of government and distinguish between governmental and non-governmental organizations.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level recognize characteristics that make a strong leader. They list world leaders past and present and match them to their form of government.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.6.3.1 explain the economic reasons for immigration and migration.
SS.6.3.2 demonstrate an understanding that competition among sellers results in lower prices.
SS.6.3.3 compare the basic characteristics of communism, socialism and capitalism.
SS.6.3.4 explain and outline the steps in producing and marketing goods.
SS.6.3.5 assess the economic impact of technology on regions.
SS.6.3.6 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries).
SS.6.3.7 trace the development of treaties and organizations related to trade.
SS.6.3.8 compare production and consumption of goods and services in different countries.

Performance Descriptors (SS.PD.6.3)

- **Distinguished**
  Sixth grade students at the distinguished level evaluate economic systems in selected nations in relation to the United States economic system.
- **Mastery**
  Sixth grade students at the mastery explain the impact of technology, trade cartels and treaties, on the production, marketing and consumption of goods and services and employment in selected nations.
- **Partial Mastery**
  Sixth grade students at the partial mastery level describe jobs and types of technology used in production, marketing and consumption of goods and services. They define and recognize trade cartels and treaties related to selected nations.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
Students will:

SS.6.4.1 determine the time at one location when informed of the time at another location using a world time zone map.

SS.6.4.2 use map tools (legends, keys, scales) to interpret information (e.g., climate, landforms, resources).

SS.6.4.3 identify changes in population due to shifts from agricultural to industrial/urban development.

SS.6.4.4 locate and identify the continents, major climates, major bodies of water and natural resources (e.g., knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, lakes), and compare and analyze the relationship of people and the environment with regard to population, settlement and trade.

SS.6.4.5 locate the major waterways of North America, South America, Western Europe and the Middle East, and explain their impact on exploration, settlement and trade. (e.g., discuss how the opening of the Erie Canal contributed to the rise of New York City).

SS.6.4.6 draw conclusions about the effects of geography on transportation, culture, economic activities, population density and distribution using maps.

SS.6.4.7 explain the changing nature of the earth's surface (e.g., earthquakes, volcanoes).

SS.6.4.8 compare and contrast general characteristics of the population of selected regions with regard to economics, religion, language and movement.

SS.6.4.9 interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, life expectancy).

SS.6.4.10 examine changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world.

Performance Descriptors (SS.PD. 6.4)

- **Distinguished**
  Sixth grade students performing at the distinguished level explain the physical and human processes that shape the earth's surface and predict future changes. Students construct and/or use complex time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students compare and contrast the selected regions of the world with respect to migration including economics, religion and language. They analyze and evaluate the characteristics of the new geographic frontiers.
- **Mastery**
  Sixth Grade students performing at the mastery level describe and explain the physical and human processes that shape the earth's surface. They construct and/or use time zone maps, globes and population pyramids to derive information about their place in the world. They use maps to draw conclusions about the effects of geography on population density, distribution and movement. Students describe selected regions of the world with respect to migration including economics, religion and language. They identify the new geographic frontiers.

- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify the physical and human processes that shape the earth's surface. Students use grade level geographic tools to recognize their place in the world. Students use simple maps to describe the effects of geography on population density, distribution and movement. They identify the movement of economics, religion and language from selected regions of the world. They locate the new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.6.5.1 identify and evaluate contributions of classical civilizations and cite reasons for their rise and fall.

SS.6.5.2 explain the basic tenets of major monotheistic religions and their impact on western civilizations.

SS.6.5.3 identify the contributions and characteristics of Arab/Islamic society and Judea-Christian societies.

SS.6.5.4 identify the causes and consequences of the Protestant Reformation.

SS.6.5.5 identify how Europeans benefited by expansion in the New World.

SS.6.5.6 explain the competition of the English and French on the American frontier.

SS.6.5.7 explain the systems of slavery developed in North America, Latin America, Iberia and Africa.

SS.6.5.8 describe the impact of the slave trade on the political, economic and social systems in North America, Latin America, Iberia and Africa.

SS.6.5.9 identify agricultural products exchanged between the New and Old Worlds during the age of exploration.

SS.6.5.10 identify major historical events in the development of transportation systems (water, rail, motor vehicles, aviation).

SS.6.5.11 outline or build a timeline showing the influx of ethnic groups into North America.

SS.6.5.12 explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas.

SS.6.5.13 analyze and trace the evolution of democracy during the nineteenth century in western nations.

SS.6.5.14 compare and contrast the worth of the individual in different societies over time.

SS.6.5.15 develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map.

SS.6.5.16 outline events in the Abolition movement and the results of the Emancipation Proclamation and Amendments 13, 14, 15.

SS.6.5.17 explain the causes and effects of the Great Depression and the political responses of governments to this crisis (rise of Hitler, Fascism, militarism in Japan, New Deal in the United States).

SS.6.5.18 identify global tensions which led to the outbreak of WW I and WW II.

SS.6.5.19 identify key figures, philosophies and events in the Minority Rights movements including civil rights and rights of women.

SS.6.5.20 explain the impact of the use of atomic weapons.

Performance Descriptors (SS.PD.6.5)

- **Distinguished**
  Sixth grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct historical period and context. They examine the contributions of the civilizations of North America, South America, Europe and the Middle East and assess how those contributions advanced that culture and influenced other cultures.
- **Mastery**
  Sixth grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They identify and explain contributions of the civilizations of North America, South America, Europe and the Middle East with an emphasis on exploration and colonization, the Industrial Revolution and religions of the world. They compare and contrast the cultural characteristics of each selected region.
- **Partial Mastery**
  Sixth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They identify contributions of major civilizations of North America, South America, Europe and the Middle East and list the cultural characteristics of each region.

Seventh Grade Social Studies Content Standards and Objectives

The seventh grade is a study of geography through the six essential elements: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; Environment and Society; and Uses of Geography. Students will examine people and places, and analyze the relationships between them. These relationships include cultures, history, environmental concerns and political and economic systems. Students will use maps, graphs, charts and other technologies in achieving an understanding of a geographical perspective. Students will formulate concepts directly related to those ideals that foster citizenship. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.7.1.1 compare and contrast individual rights of citizens in a variety of world regions.
SS.7.1.2 explain how actions citizens take can influence public policy decisions.
SS.7.1.3 compare and contrast nations' laws that may or may not provide order, predictability and security.

SS.7.1.4 locate, access and organize information about an issue of public concern from multiple points of view.

SS.7.1.5 identify and practice selective forms of civic discussion and participation consistent with the ideas of citizens in a democratic republic.

SS.7.1.6 recognize and explain the difference between power and authority.

Performance Descriptors (SS.PD.7.1)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the rights of citizens from various world regions and determine how they relate to those of U.S. citizens. They evaluate the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They also assess the difference between power and authority.
- **Mastery**
  Seventh grade students performing at the mastery level describe the rights of citizens from various world regions comparing and contrasting them to those of U.S. citizens. They explain and analyze the influence that the American democratic system has had on other nations and the influence those nations have had on American politics and society.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify the rights of citizens from various world regions and compare them to those of U.S. citizens. They identify some of the influences that the American democratic system has had on other nations and the influence those nations have had on American politics and society. They recognize some of the differences between power and authority.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.7.2.1 identify and explain the different forms of government in various world regions.

SS.7.2.2 compare and contrast the lawmaking processes of world governments.

SS.7.2.3 analyze the different ways nations provide order and protect justice.

SS.7.2.4 debate the importance of limited government and the rules of law.

SS.7.2.5 differentiate various methods that nations use to interact with one another to resolve problems and conflicts.

SS.7.2.6 recognize the influence of the United States on other nations and the influence of other nations on the American political process and society.

Performance Descriptors (SS.PD.7.2)

- **Distinguished**
  Seventh grade students performing at the distinguished level analyze different forms, processes and purposes of government in order to rank their effectiveness. They assess examples of methods used to address international conflicts to determine the level of resolution.
- **Mastery**
  Seventh grade students performing at the mastery level compare and contrast different forms, processes and purposes of world governments. They differentiate the ways nations interact with one another to resolve problems.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify different forms of government and their purposes. They list ways nations interact with one another to solve problems.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.7.3.1 demonstrate an understanding of how competition among buyers of a product results in higher prices of that product.
SS.7.3.2 analyze how geography influences the economy of a region.
SS.7.3.3 describe the relationship between supply, demand and the price of a product.
SS.7.3.4 compare and contrast various social services provided by world governments.
SS.7.3.5 identify and compare different types of economic systems.
SS.7.3.6 describe the impact of technology on agriculture and industry throughout the world.
SS.7.3.7 identify and classify the different types of world trade organizations.
SS.7.3.8 identify the impact and global effects of a strike on an industry.
SS.7.3.9 explain how countries are economically interdependent.
SS.7.3.10 define basic economic terminology and apply it to economic development of world regions.

Performance Descriptors (SS.PD.7.3)

- **Distinguished**
  Seventh grade students at the distinguished level apply economic principles to evaluate how the interdependence of global economies influences price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.
- **Mastery**
  Seventh grade students at the mastery level compare economic systems and explain their interdependence in terms of opportunity cost and competition and their impact on price determination, government services, technological changes in agriculture and industrial development, resource use and trade policy.

- **Partial Mastery**
  Seventh grade students at the partial mastery level describe the characteristics of economic systems and present examples of opportunity costs, price determination, government services, agricultural and industrial technology, resource use, and trade policy.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment. (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives
The students will:

SS.7.4.1 use correct geographic terminology.
SS.7.4.2 draw conclusions about information presented on special purpose maps and be able to differentiate among map types.
SS.7.4.3 understand the use of directions (e.g., cardinal directions, subordinate directions, latitude and longitude).
SS.7.4.4 identify and locate the seven continents of the world and their associated oceans, seas, rivers and landforms.
SS.7.4.5 identify countries, cities and transportation networks on maps.
SS.7.4.6 identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts, graphs, polar projection).
SS.7.4.7 identify how mental maps (perceptions) affect our judgments about people and places.
SS.7.4.8 locate and identify major world rivers, climate areas and rain forests.
SS.7.4.9 identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity).
SS.7.4.10 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic).
SS.7.4.11 identify geographic factors and cultural factors that block the movement of ideas and innovations.
SS.7.4.12 analyze the growth of tourism and its impact on regional environments and culture.
SS.7.4.13 analyze interconnections between regions (e.g., goods and services, music, language, religion).
SS.7.4.14 identify how human processes impact the world's physical environment (e.g., pollution, clear-cutting, strip mining).
SS.7.4.15 identify the world's climatic regions and the ways in which they influence lifestyle.
SS.7.4.16 analyze renewable and nonrenewable resources (e.g., hydroelectric power and fossil fuels), and explain how technology affects the ways in which culture groups perceive and use their resources.
SS.7.4.17 analyze the technological improvements in transportation and communication that have helped create a global society.
SS.7.4.18 explain the common geographic factors associated with the development of world urban centers.
SS.7.4.19 explain cooperation and conflict over control of the world's resources.
SS.7.4.20 compare and contrast the characteristics of demographic structure through population pyramids (e.g., total size, birth rates, age, distribution, doubling time).

SS.7.4.21 define the term culture and use the term in a geographic context (e.g., isolation, core area, movement).

SS.7.4.22 investigate and describe new geographic frontiers such as the oceans, Antarctica and airspace.

Performance Descriptors (SS.PD.7.4)

- **Distinguished**
  Seventh grade students performing at the distinguished level use precise geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions using spatial data. They compare and contrast geographic regions of the world and clearly explain the connections between them. Students analyze and describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Mastery**
  Seventh grade students performing at the mastery level use appropriate geographic terminology in the construction and/or use of geographic tools such as special purpose maps to draw conclusions from spatial data. They compare and contrast geographic regions of the world and the connections between them. Students describe how the physical and human processes interact to shape the environment. They investigate and describe new geographic frontiers.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level use geographic terminology and geographic tools such as special purpose maps to sometimes recognize information from spatial data. Students identify geographic regions of the world and the connections between them, and describe the physical and human processes that shape the environment. They identify new geographic frontiers.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.7.5.1 describe the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India).

SS.7.5.2 draw world history conclusions from maps, globes, charts, posters, graphs and timelines.

SS.7.5.3 identify conditions that have influenced or altered the movement of people throughout the world.

SS.7.5.4 identify religious and secular celebrations observed around the world.

SS.7.5.5 explain the role of racial and ethnic minorities and women in the advancement of civil rights.

SS.7.5.6 compare and contrast the beliefs, religion and mythology of native cultures throughout the world.

SS.7.5.7 explain what occurs when people from different regions interact.

SS.7.5.8 draw conclusions about the effect of the environment on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers).

SS.7.5.9 identify and use processes important to reconstruction and reinterpreting the past such as using a variety of sources, providing, validating and weighing evidence and checking creditability of sources.

SS.7.5.10 describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War).

Performance Descriptors (SS.PD.7.5)

- **Distinguished**
  Seventh grade students performing at the distinguished level evaluate the significance of people, places, documents, ideas and events in their correct period and context. They examine the impact of migration on religions, governments, societies, cultures, and find evidence of cultural assimilation.
- **Mastery**
  Seventh grade students performing at the mastery level identify people, places, documents, ideas and events in their correct historical period and context. They trace and describe the effects of migration on religions, governments, societies and cultures past and present.
- **Partial Mastery**
  Seventh grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They explain major migrations and describe the spread of major religious, political and cultural beliefs.

Eighth Grade Social Studies Content Standards and Objectives

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental and economic factors involved in the history of the state. Citizenship and how the citizen influences public policies will be emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.8.1.1 evaluate how citizens can participate in government at the local, state and national levels (e.g., voting, community service, letter writing).

SS.8.1.2 identify and practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic.

SS.8.1.3 analyze the effectiveness of selected public policies and citizen behaviors in recognizing the stated ideas of a democratic republic.

SS.8.1.4 explain the relationship between policy statements and action plans used to address issues of public concern.

SS.8.1.5 explain the political process and the opportunities for citizens to influence government.

SS.8.1.6 locate, access, analyze, organize and apply information about selected public issues, recognizing and explaining multiple points of view.

SS.8.1.7 explain and analyze various forms of citizen action that influence public policy. (e.g., how groups can work with governmental agencies to impact the development of tourism).

SS.8.1.8 analyze the influence of diverse forms of public opinion on the development of public policy and decision making.

SS.8.1.9 examine the strategies designed to strengthen the common good, which consider a range of options for citizen action.

SS.8.1.10 identify, analyze, evaluate and interpret sources and examples of the responsibilities, privileges and rights of citizens.

SS.8.1.11 explain the role and importance of voting in the democratic process and practice the voting process by participating in a class/school/state mock election.

SS.8.1.12 identify voting as a responsibility and right of citizens, and identify the legal voting age.

SS.8.1.13 identify ways students can participate in the governance of their school and community.

SS.8.1.14 develop and utilize a process to express opinion, resolve problems and/or seek assistance.

SS.8.1.15 examine and analyze a local community and propose ways in which tourism can be developed.

SS.8.1.16 develop a mock bill to promote tourism in West Virginia.

Performance Descriptors (SS.PD.8.1)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and predict how citizen actions and civic participation influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Mastery**
  Eighth grade students performing at the mastery level describe and classify actions and participation that influence public policy, action plans and public opinion reflecting the common good and the core democratic values of American democracy.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify citizen actions and participation that influence public policy, action plans, and public opinion reflecting the common good and the core democratic values of American democracy.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives:
Students will:

SS.8.2.1 analyze the division of powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government.

SS.8.2.2 identify the duties and requirements of elected officials at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commissioners).

SS.8.2.3 examine the amendment process of the West Virginia Constitution.

SS.8.2.4 identify and chart the process of how a bill becomes law in West Virginia. (e.g., a bill to promote tourism).

SS.8.2.5 analyze the functions and jurisdictions of the federal, state, local and special courts (e.g., United States Supreme Court, State Supreme Court, circuit courts, magistrate courts, family courts).

SS.8.2.6 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisan).

SS.8.2.7 research and describe how special interest groups influence government and the law-making process in West Virginia. (e.g., West Virginia Education Association, United Mine Workers, Division of Tourism).

SS.8.2.8 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies)

SS.8.2.9 identify and analyze individual rights and privileges protected by the United States and West Virginia Constitutions and laws.

SS.8.2.10 explain major principles of American constitutional government, (e.g., federalism, separation of powers, the elastic clause, checks and balances, government by consent of the governed, individual rights) and compare to the West Virginia Constitution.

SS.8.2.11 analyze conditions under which constitutional government flourishes.

SS.8.2.12 compare and contrast rights and privileges of the individual citizen.

SS.8.2.13 examine laws passed in a legislative session and list those that impact the development of tourism.

Performance Descriptors (SS.PD.8.2)

- **Distinguished**
  Eighth grade students performing at the distinguished level compare and contrast the structure and function of the governments of West Virginia and the United States. They analyze the purpose of taxation to determine its importance to the function of government. They compare and contrast the contributions of individuals and groups who have influenced the law-making process.
- **Mastery**
  Eighth grade students performing at the mastery level define the structure and function of the governments of the United States and West Virginia, including finance. They describe how individuals and groups have influenced government and the law-making process.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the three branches of West Virginia and United States government and list functions of each. They list individuals/groups that influence the law-making process.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.8.3.1 describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration).
SS.8.3.2 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these resources impacts the state's economy.
SS.8.3.3 explain the benefits of trade to West Virginia's economy.
SS.8.3.4 examine economic reasons for the deterioration of some downtown areas in twentieth century West Virginia and the renaissance of others.
SS.8.3.5 determine the factors that caused West Virginia to become a leader in the production of salt, coal and electricity.
SS.8.3.6 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia and how they relate to occupations.
SS.8.3.7 describe and analyze the effects of national and state governmental actions on West Virginia's economy.
SS.8.3.8 describe and analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans).
SS.8.3.9 analyze and predict the changes in West Virginia's economy and people due to industrial development, and debate the issue of industrialization vs. preserving history.
SS.8.3.10 examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry).
SS.8.3.11 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts).
SS.8.3.12 list some of the major industries in West Virginia and identify representative jobs under each. (e.g., manufacturing, mining, tourism, health care).
SS.8.3.13 describe the economic benefit of changing tourist attractions from seasonal to year round. (e.g., Snowshoe).

Performance Descriptors (SS.PD. 8.3)

- **Distinguished**
  Eighth grade students at the distinguished level apply economic principles to design an economic development plan for West Virginia, which provides for the future development of infrastructure, industry, agriculture and human services.
- **Mastery**
  Eighth grade students at the mastery level explain the government policies, technological changes, private institutions, factors of production and competition affecting changes in labor/management relations, resource use and industrial development and occupation choices in West Virginia.
- **Partial Mastery**
  Eighth grade students at the partial mastery level identify the government policies, private institutions and labor/management relations, and recognize the effect on West Virginia employment over time.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.8.4.1 describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles.
SS.8.4.2 identify West Virginia's location by latitude and longitude including degrees, minutes and seconds.
SS.8.4.3 identify West Virginia's man-made and natural borders.
SS.8.4.4 use a map to identify the four major geographic regions, major rivers, landforms and points of interest in West Virginia.
SS.8.4.5 identify, analyze and discuss West Virginia's geographic regions through reading descriptive literature.
SS.8.4.6 identify the location of West Virginia in relationship to neighboring states and the eastern United States.
SS.8.4.7 use a map to identify the counties and major cities in West Virginia.
SS.8.4.8 cite reasons for the development of the West Virginia transportation system.
SS.8.4.9 draw conclusions about climate, landforms and resources in West Virginia's four geographic regions using special purpose maps.
SS.8.4.10 explain how the cultural and economic isolation of different areas of the United States and West Virginia have been changed through technological advances (e.g., TV, radio, telephone, computers, highways).
SS.8.4.11 describe West Virginia's climate, its effect on people's lives.
SS.8.4.12 use a map to explain the settlement, exploration and population patterns of West Virginia in relation to geographic features.
SS.8.4.13 identify the geographic factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia.
SS.8.4.14 define region and list various regions found in West Virginia. (e.g., geographic, tourist).
SS.8.4.15 identify and locate counties in the 8 tourist regions of West Virginia.
SS.8.4.16 explain how West Virginia's environment affects tourism.

Performance Descriptors (SS.PD.8.4)

- **Distinguished**
  Eighth grade students performing at the distinguished level differentiate ways that physical and cultural processes impact human environment interaction in West Virginia. Students use a broad variety of resources to evaluate spatial information about infrastructure and industry in West Virginia.
- **Mastery**
  Eighth grade students performing at the mastery level explain ways the physical and cultural processes impact on human environment interaction in West Virginia. Students use a variety of resources including maps, Geographic Information System (GIS), fiction and non-fiction literature to interpret spatial information about infrastructure and industry in West Virginia.

- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify the ways physical and cultural processes impact on human environment interaction in West Virginia. Students use resources such as maps, Geographic Information System (GIS) and literature to describe spatial information about infrastructure and industry in West Virginia.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.8.5.1	list reasons for exploration, major explorers, their routes and discoveries on the western Virginia frontier.
SS.8.5.2	sequence the events and incentives for Virginia's expansion west to the Ohio River.
SS.8.5.3	compare and contrast French and English explorers, settlers and settlements on the western frontier.
SS.8.5.4	sequence the events that led to the formation of the state of West Virginia.
SS.8.5.5	identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans.
SS.8.5.6	identify the types of transportation which facilitated the growth of West Virginia and western expansion.
SS.8.5.7	sequence and analyze the impact of contemporary social, economic and technological developments on people and culture in West Virginia and the United States.
SS.8.5.8	describe and analyze the evolution of the labor movement in West Virginia and the United States.
SS.8.5.9	identify the role of ethnic and racial minorities and women in West Virginia's history.
SS.8.5.10	explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War).
SS.8.5.11	draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models and timelines.
SS.8.5.12	describe the cultural conflict between the Europeans and Native Americans as it relates to West Virginia.
SS.8.5.13	explain the effect of immigration on the culture of West Virginia from European settlement through the early twentieth century.
SS.8.5.14	identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (e.g., statehood movement, abolition movement, education, industry, literature).
SS.8.5.15	identify and explain the significance of historical experience and of geographical, social and economic factors that have helped to shape both West Virginian and American society.
SS.8.5.16	describe the moral, ethical and legal tensions that led to the creation of the new state of West Virginia and how those tensions were resolved.
SS.8.5.17	identify and locate places of historical importance in West Virginia that can be visited by tourists.

SS.8.5.18 list fairs and festivals in West Virginia that can be attributed to the influence of various cultural groups who have settled in the state.

Performance Descriptors (SS.PD.8.5)

- **Distinguished**
  Eighth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical context and their impact on future events. Students explain how the conflicts and differences within the state led to regionalism. They examine how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine significant industry, labor, transportation and technology issues and propose solutions to current problems in these areas. Students identify the art, literature and music that define the unique character of the state.
- **Mastery**
  Eighth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the conflicts within the state and the effects of national events on the state. They explain how the economy, government, society and diverse cultures influenced the formation of the state. They examine significant industry, labor, transportation and technology issues and describe challenges facing West Virginia today. Students identify the art, literature, and music that define the unique character of the state.
- **Partial Mastery**
  Eighth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe conflicts affecting the state. They explain how the economy, government, society and diverse cultures influenced the formation and growth of the state. They examine issues from a historical perspective and identify challenges facing West Virginia today. Students identify art, literature and music that define the unique character of the state.

Ninth Grade Social Studies Content Standards and Objectives

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation as a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely-differing environments were met by a diverse population. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)

Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives

Students will:

SS.9.1.1 compare and contrast various citizens' responses to controversial government actions.

SS.9.1.2 justify the importance of the fundamental democratic values and principles of United States constitutional democracy to individuals, communities and nations.

SS.9.1.3 make informed decisions as to what government should and should not do.

SS.9.1.4 explain how citizens, interacting with one another, monitor and influence their government.

SS.9.1.5 evaluate ways conflicts can be resolved in a cooperative, peaceful manner that respects individual rights and promotes the common good.

SS.9.1.6 evaluate, take and defend positions on issues in which fundamental democratic values and principles are in conflict, (e.g., liberty and equality, individual rights and the common good, majority rule, minority rights).

SS.9.1.7 define United States citizenship and evaluate the characteristics of a citizen.

SS.9.1.8 evaluate, take and defend positions on issues regarding the criteria used for naturalization.

SS.9.1.9 evaluate sources of information related to public policy issues.

SS.9.1.10 participate in a project of volunteer service.

SS.9.1.11 assess and evaluate responsibilities, privileges and rights of United State citizens.

Performance Descriptors (SS.PD.9.1)

- **Distinguished**
  Ninth grade students performing at the distinguished level draw conclusions about the effects of government actions. Students assess the reasons why citizens monitor and influence U.S. government, evaluate the way conflicts can be resolved that respects individual rights, and evaluate the criteria used in the naturalization process.
- **Mastery**
  Ninth grade students performing at the mastery level compare and contrast government actions. Students explain how citizens monitor and influence U.S. government, draw conclusions about the way conflicts can be resolved that respects individual rights and describe the criteria used in naturalization.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify various government actions, describe how citizens monitor and influence U.S government, recall ways conflicts can be resolved that respect individual rights, and identify some of the criteria used in naturalization.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.9.2.1 identify and describe the fundamental democratic principles and values in core American documents and identify the discrepancies between the ideals expressed and realities.

SS.9.2.2 identify fundamental American democratic principles using primary sources and significant political speeches and writings.
SS.9.2.3 explain the purpose of the United States government and analyze how its powers are acquired, used and justified.
SS.9.2.4 summarize documents and philosophies that are the basis for representative democracy in the United States.
SS.9.2.5 explain the purpose, organization and functions of the legislative, executive and judicial branches, and analyze separations of powers and checks and balances.
SS.9.2.6 explain the steps required to amend the United States Constitution.
SS.9.2.7 analyze the presidential election process, the continued use of the Electoral College and the order of presidential succession.
SS.9.2.8 explain federalism and give examples of shared, delegated, reserved and implied powers.
SS.9.2.9 summarize the Constitution's Articles and Amendments.
SS.9.2.10 analyze the fundamental ideas found in the nation's core documents and relate them to the subsequent periods in United States history.
SS.9.2.11 evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government.
SS.9.2.12 evaluate, take and defend positions about the functions of political leadership and the importance of public service in American democracy.

Performance Descriptors (SS.PD.9.2)

- **Distinguished**
  Ninth grade students performing at the distinguished level differentiate between the documents and philosophies that are the basis for United States democracy. They relate the fundamental ideas in the nation's core documents to subsequent periods of United States history. They determine how citizens influence public policy.
- **Mastery**
  Ninth grade students performing at the mastery level summarize the documents and philosophies that are the basis for United States democracy. They give examples of fundamental ideas from core national documents. They explain methods used for citizens to influence public policy.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level recall the documents and philosophies that are the basis for United States democracy. They identify the fundamental ideas in the nation's core documents. They list methods that citizens use to influence pubic policy.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives

Students will:

SS.9.3.1 determine the relationship among the law of supply and demand, production and consumption.
SS.9.3.2 examine the role of the United States government in banking, finance and monetary systems.
SS.9.3.3 describe how the United States economic system changed from mercantilism to free enterprise capitalism.

SS.9.3.4 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era.

SS.9.3.5 describe the cause and effect relationship between the labor movement and industrialization in the United States.

SS.9.3.6 explain the concept of capitalism and compare the basic components to other economic systems.

SS.9.3.7 identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system.

SS.9.3.8 analyze the effects of foreign trade and tariff policies on the United States.

Performance Descriptors (SS.PD.9.3)

- **Distinguished**
  Ninth grade students at the distinguished level use primary sources to evaluate the impact of monetary and fiscal policies, industrialization and commerce patterns on the creation and evolution of the United Stated economic system to 1900.
- **Mastery**
  Ninth grade students at the mastery level examine how the development of the banking system, taxation policies, industrialization and trade policy affected the creation/evolution of the United States economic system (and immigration and migration to 1900).
- **Partial Mastery**
  Ninth grade students at the partial mastery level explain the development of mercantilism, the banking system, industrialization, taxation and trade policies in the creation and evolution of the United States economic system and immigration and migration to 1900.

Standard 4: Geography (SS.S.4)

Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.9.4.1 locate major meridians of longitude and parallels of latitude.

SS.9.4.2 locate states and capitals, landforms and major events in United States history.

SS.9.4.3 analyze the role of mental maps in the movement of people across the United States.

SS.9.4.4 use the most appropriate maps and graphics in an atlas to answer specific questions about geographic issues (e.g., topography, transportation routes).

SS.9.4.5 evaluate the effects of population growth on urbanization

SS.9.4.6 interpret how people express attachment to places and regions (e.g. by reference to essays, novels, poems, short stories, feature films, traditional musical compositions such as "God Bless America" and "America the Beautiful").

SS.9.4.7 explain the impact of health and cultural considerations on the quality of life over different historical time periods.

SS.9.4.8 analyze the relationship of Native American cultures to their physical environment.

SS.9.4.9 describe geographic differences which contributed to economic development and regionalism prior to the Civil War.

SS.9.4.10 identify and describe major landforms, cities, rivers and climate areas of the United States and compare to those throughout the world.

SS.9.4.11 explain settlement, population patterns and the growth of service centers from reading and interpreting maps, graphs and charts.

SS.9.4.12 analyze the impact of the environment, including the location of natural resources, on immigration and settlement patterns.

SS.9.4.13 describe the socioeconomic changes that occur in regions that experience population change.

SS.9.4.14 explain and analyze the human impact on the environment throughout the American experience.

SS.9.4.15 analyze the ways in which physical and human features have influenced the evolution of significant historic events and movements.

Performance Descriptors (SS.PD.9.4)

- **Distinguished**
  Ninth grade students' performing at the distinguished level explain how physical processes create, sustain and modify natural environments. They analyze and predict the impact of human activities on the environments of the United States. Students interrelate the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction
  and/or use of tools and techniques to the evolution of significant historical events and social movements to 1900.
- **Mastery**
  Ninth grade students performing at the mastery level explain how physical processes create, sustain and modify natural environments. Students interpret the impact of human activities on the environments of the United States, and explain the physical and human characteristics of place and describe how the cultures are linked. They apply geographic perspective through the construction and/or use of tools and techniques to the evolution of significant historical events and social movements to1900.
- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify physical processes that affect the environment and identify the human activities that impact the environments of the United States. Students describe the physical and human characteristics of place, sometimes recognize how the cultures are linked and identify geographic perspective through the use of tools and techniques to the evolution of significant historical events and social movements to 1900.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:

Students will:

SS.9.5.1 describe life in America before the 17th century.

SS.9.5.2 analyze and explain the contacts that occurred between Native Americans and European settlers during the age of discovery.

SS.9.5.3 trace the roots and evaluate early explorations of America, and describe and analyze the attraction of the New World to Europeans (religious, social, political, economic).

SS.9.5.4 explain and sequence the effects of European empire building , and explain how it led to the American Revolution.

SS.9.5.5 identify and explain problems between the British government and the American colonies (e.g. Parliament's right to rule, taxation, trade restrictions).

SS.9.5.6 describe and analyze the content of the Declaration of Independence and the factors which led to its creation.

SS.9.5.7 analyze, explain and sequence major events and ideas of the Revolutionary War.

SS.9.5.8 analyze and evaluate the United States Constitution and the Bill of Rights, and describe challenges faced by the new United States government.

SS.9.5.9 identify the Constitution as a response to the political, economic and social conditions that existed after the American Revolution.

SS.9.5.10 explain the major challenges faced by the framers of the United States Constitution, and describe the compromises reached at the Constitutional Convention.

SS.9.5.11 evaluate how nationalism affected the constitutional, political, economic and foreign policy issues faced by the United States in its formative years.

SS.9.5.12 identify and explain the impact of United States Supreme Court decisions (e.g., Marbury v. Madison, McCollough v. Maryland, Dred Scott, Plessy v. Ferguson).

SS.9.5.13 describe and explain the growth and change in the United States from 1801 to 1861.

SS.9.5.14 identify and explain the factors that led to exploration, settlement and expansion across the United States.

SS.9.5.15 assess the effect of United States policy on Native Americans.

SS.9.5.16 describe the institution of slavery and its effect on the political, economic and social development of the United States.

SS.9.5.17 compare and contrast the political, economic and social conditions in the United States before and after the Civil War.

SS.9.5.18 analyze and sequence the causes and effects of the major events of the Civil War and reconstruction.

SS.9.5.19 describe the effects of technological change on the United States (e.g., agriculture, transportation, industry, labor, society).

SS.9.5.20 describe and analyze the goals and actions of reformers and reform movements.

SS.9.5.21 describe the influence and impact of diverse cultures on United States society and their assimilation into American life.

SS.9.5.22 explain the development of representative democracy in the United States.

SS.9.5.23 explain major conflicts in terms of causes and consequences.

SS.9.5.24 identify, analyze and interpret primary sources (e.g. artifacts, diaries, letters, photographs, art, documents, newspapers) and contemporary media (e.g. television, movies, computer information systems) to better understand events and life in the United States to 1900.

SS.9.5.25 construct various timelines of American history from pre-Columbian times to 1900 highlighting landmark dates, events, technological changes, major political and military events and major historical figures.

SS.9.5.26 develop skills in discussion, debate and persuasive writing by analyzing historical situations and events to 1900.

Performance Descriptors (SS.PD.9.5)

- **Distinguished**
  Ninth grade students at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. Students explain the evolution and assess the effects of expansion, conflict and emerging technologies in creating a new nation. Students demonstrate an intricate knowledge of the framework and workings of the federal government. They develop well-reasoned arguments regarding complex, critical issues.
- **Mastery**
  Ninth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. Students explain the evolution and effects of expansion, conflict and emerging technologies in creating a new nation. Students describe the development of the federal government and explain governmental actions. They develop well-reasoned arguments regarding critical themes and issues.

- **Partial Mastery**
  Ninth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. Students describe the causes and effects of expansion and conflict and the results of emerging technology in creating a new nation. They explain the development of the federal government and describe governmental actions.

Tenth Grade Social Studies Content Standards and Objectives

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography/map skills and critical thinking skills are emphasized. West Virginia teachers are responsible for analyzing the benefits of technology for learning and for integrating technology appropriately in the students' learning environment. See the related grade-level Technology Standards and Objectives.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives
Students will:

SS.10.1.1 describe the evolution of the roles and responsibilities of individuals and groups leading to the formation of nation states.
SS.10.1.2 analyze the reasons for and the consequences of the breakdown of order among nations and the impact on the lives of individuals.
SS.10.1.3 analyze the nature of civic responsibility in various cultures.
SS.10.1.4 analyze the causes of conflict and propose resolutions.
SS.10.1.5 participate in a project of volunteer service.

Performance Descriptors (SS.PD.10.1)

- **Distinguished**
  Tenth grade students performing at the distinguished level predict how the roles and responsibilities of United States citizenship will change and evaluate them in terms of other cultures in relation to foreign policy issues to1900.
- **Mastery**
  Tenth grade students performing at the mastery level recognize the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify some of the changing roles and responsibilities of United States citizenship and identify their relationship to other cultures in light of significant political developments, trends and foreign policy issues to1900.

Standard 2: Civics / Government (SS.S.2)

Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.10.2.1 evaluate diverse ideas about the purposes of government.
SS.10.2.2 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.
SS.10.2.3 discuss world historical events which affected the development of representative democracy in the United States and other countries.
SS.10.2.4 analyze how the United States has influenced other nations and how other nations have influenced the American political process and society.
SS.10.2.5 compare, contrast and evaluate alternative ways of organizing constitutional governments.
SS.10.2.6 identify significant political philosophers and their contributions.

Performance Descriptors (SS.PD.10.2)

- **Distinguished**
  Tenth grade students performing at the distinguished level draw parallels between the influence of the United States on other nations and the influence of other nations on the American political process and documents and draw conclusions about those influences. They discriminate between different structures/types of constitutional governments.
- **Mastery**
  Tenth grade students performing at the mastery level use examples, (e.g., classical civilizations), to show how the United States has influenced other nations and how other nations have influenced American political processes and documents. They compare and contrast alternative ways of organizing constitutional governments.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level list examples of United States' influence on other nations and the influence of other nations on American political processes and documents. They categorize different forms of constitutional governments.

Standard 3: Economics (SS.S.3)
Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives
Students will:

SS.10.3.1 define and illustrate the trade patterns of regions of the world across time.
SS.10.3.2 describe and analyze how various societies developed economic systems.
SS.10.3.3 analyze the role of exchange/trade systems as economic systems developed.
SS.10.3.4 compare and contrast fiscal policies of several world societies.
SS.10.3.5 identify a cause and effect relationship of economic change and its effect on the job market. (e.g., the growth of tourism in West Virginia and the resulting change intypes of jobs that are available).
SS.10.3.6 describe and explain global economic interdependence and competition using examples to illustrate their influence on national and international policies.

Performance Descriptors (SS.PD.10.3)

- **Distinguished**
  Tenth grade students at the distinguished level use factors of production, scarcity and competition to evaluate the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Mastery**
  Tenth grade students at the mastery level use factors of production, scarcity, and competition to explain and compare the development, interactions and choices made by different economic systems regarding the evolution of institutions, resource use, government spending, trade policy and the impact on the worker/consumer and global economy to 1900.
- **Partial Mastery**
  Tenth grade students at the partial mastery level recognize and describe the evolution of institutions, resource use, government spending, production, scarcity, competition and trade policy associated with the economic systems in selected nations to 1900.

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives

Students will:

SS.10.4.1 read and interpret information using maps, graphs and charts.
SS.10.4.2 identify and label geographic features of the continents (e.g., plateaus, high points, low points, bodies of water major river valleys).
SS.10.4.3 identify world language patterns.
SS.10.4.4 describe the evolution of significant world trade routes.
SS.10.4.5 describe and analyze the migration of people during this era.
SS.10.4.6 identify world resources and explain how the location of resources influenced economic development and the global economy.
SS.10.4.7 identify the effect of geographic features, including climate, upon the environment.
SS.10.4.8 explain the development of major political boundaries of the world and relate these to the theme of geo-politics.
SS.10.4.9 identify and analyze the physical and cultural patterns of settlement.
SS.10.4.10 identify and explain geographic reasons for the development of major world cities and trends in urban population growth.
SS.10.4.11 locate and identify major world rivers, climate areas and rain forests.

Performance Descriptors (SS.PD.10.4)

- **Distinguished**
  Tenth Grade students performing at the distinguished level independently interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students synthesize the physical and human process interaction responsible for the characteristics of regions.
- **Mastery**
  Tenth Grade students performing at the mastery level interpret, construct and use geographic tools to analyze and classify spatial information to further their understanding of geographic perspective. The students explain and analyze the physical and human processes responsible for the characteristics of regions.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level use geographic tools to explain spatial information. The students recognize the physical and human processes responsible for the characteristics of regions.

Standard 5: History (SS.S.5)

Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives

Students will:

SS.10.5.1 examine the contributions of different historical periods through art and literature.
SS.10.5.2 describe the changes in the status of women and children throughout different historical periods.
SS.10.5.3 read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons and timelines.
SS.10.5.4 identify and explain the effects of significant political developments and trends in the world before 1900.
SS.10.5.5 identify and evaluate the interaction of early humans with their environment.

SS.10.5.6 explain the causes for the rise and decline of ancient civilizations (e.g., the river civilizations, Greek, Roman, Indian and Chinese).
SS.10.5.7 explain the basic tenets of major world religions and philosophies, their places of origin and the status of those religions today.
SS.10.5.8 describe the location, unique contributions and characteristics of Arab/Islamic society.
SS.10.5.9 discuss how feudalism affected the development of societies around the world.
SS.10.5.10 identify and evaluate the political and economic roles and the cultural contributions of religious institutions in medieval society.
SS.10.5.11 compare and contrast the acceptance of diversity in hierarchical societies.
SS.10.5.12 analyze and assess the concept of nation building (e.g., city states, Rome, rise of European nation states).
SS.10.5.13 relate the worth of the individual in society to the growth of the concept of the Renaissance man.
SS.10.5.14 describe how European needs/wants for foreign products contributed to the Age of Exploration.
SS.10.5.15 describe the role of the Enlightenment in European society.
SS.10.5.16 analyze the historical developments of the Protestant Reformation including the effects of theology, politics and economics.
SS.10.5.17 identify and assess the Agricultural and Industrial revolutions.
SS.10.5.18 analyze and assess the impact of political revolutions on society. (e.g., French, Italian, German, Latin American).
SS.10.5.19 compare and contrast the American and French revolutions and their aftermaths.
SS.10.5.20 explain reasons for and consequences of the breakdown of order among nation-states.
SS.10.5.21 identify legal systems which influenced western civilization.
SS.10.5.22 compare and contrast absolute and constitutional monarchies and identify representative leaders of each.
SS.10.5.23 identify and assess foreign colonization.

Performance Descriptors (SS.PD.10.5)

- **Distinguished**
  Tenth grade students performing at the distinguished level evaluate and demonstrate a comprehensive understanding of the significance of people, places, documents, ideas and events in their correct historical period and context, and their impact on future events. They describe cultures, economies and political systems and assess their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Mastery**
  Tenth grade students performing at the mastery level explain the significance of people, places, documents, ideas and events in their correct historical period and context. They describe cultures, economies and political systems and determine their impact on regional, national and international relations that led to conflict and/or cooperation and change.
- **Partial Mastery**
  Tenth grade students performing at the partial mastery level identify key people, places, documents, ideas and events in their correct historical period and context. They describe the characteristics of cultures, economies and political systems. Students recognize the reasons for regional, national and international conflicts and/or cooperation and change.

Eleventh Grade Social Studies Content Standards

The focus of this course is an identification and study of the interaction of geographic, political, economic and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process. Global economic independency and its impact on the individual person will be emphasized.

Standard 1: Citizenship (SS.S.1)
Students will:

- describe, demonstrate and employ the civic dispositions of good citizenship (Civic Dispositions);
- develop a respect for symbols, ideas and concepts of the United States and describe the roles of significant individuals (Respect For People, Events, and Symbols);
- develop and employ the civic skills necessary for effective citizenship by using criteria to make judgments, arrive at and defend positions and evaluate the validity of the positions or data (Evaluation Skills);
- demonstrate and employ the participatory skills of interacting, monitoring and influencing that are essential for informed, effective and responsible citizenship, including participation in civic life to shape public policy (Participatory Skills); and
- explain and practice the responsibilities, privileges and rights of United States citizens (Civic Life).

Citizenship Objectives:
Students will:

SS.11.1.1 cite examples of working cooperatively and resolving personal and world conflicts peacefully.
SS.11.1.2 analyze and evaluate the influence of citizen action on public policy and law making.
SS.11.1.3 analyze the changing nature of civic responsibility.
SS.11.1.4 develop positions and formulate actions on the problems of today and predict challenges of the future. (e.g., describe the changing job market in West Virginia and the impact of tourism).
SS.11.1.5 evaluate historical and contemporary political communication using such criteria as logical validity, factual accuracy and emotional appeal.
SS.11.1.6 participate in a project of volunteer service.
SS.11.1.7 identify and explain the importance of the personal and political responsibilities, privileges and rights of citizens.
SS.11.1.8 explain the concept of civil disobedience, provide examples and evaluate its use.

Standard 2: Civics / Government (SS.S.2)
Students will:

- identify, examine and analyze the purposes and basic principles of the United States government (Purposes of Government);
- explain, evaluate and analyze the origins and meaning of the principles, ideals and core democratic values expressed in the foundational documents of the United States (Ideals of United States Democracy);
- identify, examine and explain the structure, function and responsibilities of governments and the allocation of power at the local, state and national levels (United States Government and Politics); and
- analyze how the world is organized politically and describe the role and relationship of the United States to other nations and to world affairs (United States Government and World Affairs).

Civics/Government Objectives

Students will:

SS.11.2.1 explain the reasons for amendments ratified since 1900 and analyze their effects on American society.

SS.11.2.2 explain the role of the president in the formation of national and foreign policy.

SS.11.2.3 critique the interaction of the three branches of the federal government in an increasingly complex society.

SS.11.2.4 analyze the election process and the role of political parties and special interest groups.

SS.11.2.5 evaluate the formation, role and impact of third parties in the United States.

SS.11.2.6 examine historical and current conflicts and crises, and compare resolutions within the framework of constitutional and totalitarian systems of government.

SS.11.2.7 analyze judicial review and the procedure used to render decisions.

SS.11.2.8 analyze the changing nature of federalism and the growth of national government.

SS.11.2.9 critique the purposes and performance of international governmental and non-governmental organizations.

Standard 3: Economics (SS.S.3)

Students will:

- analyze the role of economic choices in scarcity, supply and demand, resource allocation, decision making, voluntary exchange and trade offs (Choices);
- research, critique and evaluate the roles of private and public institutions in the economy (Institutions);
- compare and contrast various economic systems and analyze their impact on individual citizens (Economic Systems);
- describe and demonstrate how the factors of production apply to the United States economic system (Factors of Production);
- analyze the elements of competition and how they impact the economy (Competition); and
- examine and evaluate the interdependence of global economies (Global Economies).

Economics Objectives:

Students will:

SS.11.3.1 evaluate the life style changes brought on by industrialization and technology. (e.g., debate industrialization vs. maintaining natural environment and the implications for tourism).

SS.11.3.2 analyze the production of services in developed and developing nations.

SS.11.3.3 explain monetary policy and its effect on society.

SS.11.3.4 explain the business cycle and how different political systems formulate policy.

SS.11.3.5 analyze the causes and consequences of the United States' national debt and its effect on the world economic system.

SS.11.3.6 apply Gross Domestic Product and per capita income calculations to compare the economies of different nations.

SS.11.3.7 compare and contrast basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment and capital.

SS.11.3.8 analyze and evaluate the economies of developing nations.

SS.11.3.9 explain the impact of technology and industrialization on the development of mass production and mass consumption.

SS.11.3.10 assess national and international economic interdependency.

SS.11.3.11 predict the outcomes of changes in all types of taxation (e.g., property, income, sales).

Standard 4: Geography (SS.S.4)
Students will:

- interpret, use and construct maps, globes and other geographic tools to locate and derive information about personal directions, people, places and environments (The World in Spatial Terms);
- describe the physical and human characteristics of place and explain how the lives of people are rooted in places and regions (Places and Regions);
- describe and explain the physical processes that shape the earth's surface and create, sustain and modify the cultural and natural environment (Physical Systems);
- identify, explain and analyze how the earth is shaped by the movement of people and their activities (Human Systems);
- analyze the interaction of society with the environment (Environment and Society); and
- explain geographic perspective and the tools and techniques available for geographic study (Uses of Geography).

Geography Objectives:
Students will:

SS.11.4.1 read and interpret maps, graphs, charts, cartoons and timelines.
SS.11.4.2 identify and locate the places significant to each period of study.
SS.11.4.3 transform primary data into maps, graphs and charts.
SS.11.4.4 relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., describe how West Virginia's geography has influenced laws that impact business, including tourism, as well as the quality of life in the state).
SS.11.4.5 identify United States settlement patterns after 1900 and draw conclusions about causes and effect.
SS.11.4.6 analyze and assess the impact of human decision-making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods and how human use of the environment affects tourism).
SS.11.4.7 interpret and assess the impact of predictable annual climate change (e.g., monsoon, flooding).
SS.11.4.8 interpret and assess the impact of unpredictable environment and change. (e.g., earthquakes, El Nino, drought).
SS.11.4.9 apply geographic factors/features in relationship to development of civilizations.
SS.11.4.10 relate and interpret the importance of geographic resources to international conflicts and cooperation since 1900 (e.g., discuss how U. S. dependence on Middle Eastern oil resulted in geo-political consequences).
SS.11.4.11 predict how physical and human features influence the evolution of significant historic events and movements.

Standard 5: History (SS.S.5)
Students will:

- examine, analyze and explain historical relationships using chronology to sequence and organize events and people in history (Chronology);
- use the processes and resources of historical inquiry to gather, examine, compare, analyze and interpret historical data (Skills and Application);
- examine, analyze and synthesize historical knowledge of major events, individuals, cultures and the humanities in West Virginia, the United States and the world (Culture and Humanities);
- use historical knowledge to analyze local, state, national, global interdependence (Interpretation and Evaluation); and
- examine political institutions and theories that have developed and changed over time (Political Institutions).

History Objectives:
Students will:

SS.11.5.1 analyze and explain the response of the United States and the world to industrialization and urbanization.
SS.11.5.2 assess the impact of United States foreign policy on different world regions (e.g., Open Door Policy, Good Neighbor Policy, Lend-Lease).

SS.11.5.3	critique United States immigration policies and assess the contributions of immigrant groups and individuals.
SS.11.5.4	analyze and explain the political, social and economic importance of World War I.
SS.11.5.5	analyze and explain the effects of the Great Depression on worldwide economic conditions.
SS.11.5.6	identify the major goals and analyze the impact of the New Deal.
SS.11.5.7	analyze and evaluate the major causes, events, personalities and effects of World War II.
SS.11.5.8	explain and assess the economic, social and political transformation of the United States since World War II.
SS.11.5.9	analyze and explain United States and World foreign policy since World War II.
SS.11.5.10	describe the development and impact of the United State's labor movement.
SS.11.5.11	trace and analyze the world labor movement and its political, social and economic effects.
SS.11.5.12	investigate concerns, issues and conflicts related to universal human rights. (e.g., Holocaust, diversity, tolerance, genocide).
SS.11.5.13	compare and contrast worldwide de-colonization and independence movements in the 20th century (e.g., Israel, India, Indo-China, third world countries).
SS.11.5.14	sequence and assess the development of civil rights in the United States and the world, and describe the contributions of significant civil rights leaders.
SS.11.5.15	research the origins and implications of the nuclear age and the Cold War.
SS.11.5.16	explain the rise of Communism and describe its current status, including the breakup of the Soviet Union.
SS.11.5.17	identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, Europe).
SS.11.5.18	analyze the effects of extremists and terrorists within and among nations, and predict their future effects.
SS.11.5.19	describe the effect of technology and its impact in creating a global community (e.g., computers, space exploration, medicine).
SS.11.5.20	explain how emerging nations influence world events.
SS.11.5.21	compare and evaluate the impact of stereotyping, conformity, acts of altruism and other behaviors on individuals and groups.
SS.11.5.22	explain how language, art, music and other cultural elements can facilitate global understanding, (e.g., use West Virginia's fairs and festivals as examples).
SS.11.5.23	evaluate the role of technology in communications, transportation, information processing, weapons development and other areas as it contributes to or helps resolve conflicts.
SS.11.5.24	evaluate, take and defend positions on foreign policies issues in light of American national interests, values and principles.
SS.11.5.25	compare and contrast Fascism, Nazism and Communism.
SS.11.5.26	identify and analyze world conflicts, including causes and consequences (e.g. World War I, World War II, Korea, Vietnam, Gulf War, Operation Enduring Freedom/Afghanistan Military Crisis).
SS.11.5.27	analyze the goals and actions of reformers and reform movements (e.g., social, economic, political).
SS.11.5.28	develop skills in discussion, debate and persuasive writing by evaluating different assessments of the causes, costs and benefits of major events in the 20th century.

TECHNOLOGY

West Virginia's vision for education includes the integration of technology throughout the curriculum so that all West Virginia students will develop technology skills that support lifelong learning (Policy 2510, 2470, 2320). Successful learning environments provide opportunities for students to use educational technology interwoven with curricular content.

The technology foundation standards for students are divided into six strands:

- Basic operations and concepts
- Social, ethical and human issues
- Technology productivity tools
- Technology communication tools
- Technology research tools
- Technology problem-solving and decision-making tools

Each strand provides a description of the technology skills and competencies required for students in grades K-12. The technology curriculum is sequential and comprehensive to provide a rigorous and challenging program of studies in all content areas. The classroom teacher should review the objectives of the previous grade level to serve as a starting point for review and maintenance in the sequential curriculum.

The West Virginia technology standards are based upon the *National Educational Technology Standards for Students* published by the International Society for Technology in Education (ISTE). Other references to support the development of the technology standards and objectives include the computer/technology standards from North Carolina, Texas, Michigan, Virginia, Wisconsin, Alaska, and the West Virginia Instructional Goals and Objectives.

As stated in West Virginia Policy 2470, "Students of all ages and citizens as lifelong learners require both the necessary skills and access to technology tools to take responsibility for their own learning, to be actively involved in critical thinking and problem solving, to collaborate and cooperate and to develop as productive citizens. Technology must be interwoven with educational improvements and reform to accomplish educational goals, increase student achievement and provide increased opportunities for lifelong learning."

West Virginia teachers are responsible for integrating technology appropriately into the learning environment to prepare students to live, learn, and work in an information-rich society. The state provides a number of resources through statewide technology initiatives for use by students and teachers. See http://access.k12.wv.us.

Technology Standards K-12

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Kindergarten Technology Standards and Objectives

The kindergarten student will begin to develop basic proficiency in the use of technology. The student will develop an awareness of responsible use of technology systems and begin to discover the purpose of productivity tools. At this introductory level, the student will collaboratively locate information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.K.1.1 locate and use letters, numbers and special keys on a keyboard [e.g., Enter, Space Bar, Letters (in student's name), and number keys];
TEC.K.1.2 use a mouse to point and click, and place the cursor at a specified location;
TEC.K.1.3 log on to computer and start and exit programs.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.K.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.K.3.1 identify word processing software as a tool for writing.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.K.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.K.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

First Grade Technology Standards and Objectives

The first grade student will continue to develop fundamental proficiency in the use of technology. The student will begin to use productivity tools while exploring the ethical issues related to products created electronically. The first grade student will continue to collaborate in locating information through technology resources. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.1.1.1 use a keyboard to input information using letters, numbers, arrow key, and delete key; begin to use left/right hand position;
TEC.1.1.2 use a mouse to click and drag;
TEC.1.1.3 start and exit programs as well as locate files.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.1.2.1 discuss ownership of computer created work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:
- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.1.3.1 type words and/or sentences using word processing software;
TEC.1.3.2 create text and insert images.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.1.5.1 participate as a group in locating information in a variety of developmentally appropriate technology resources (e.g., interactive books, educational software and elementary multimedia encyclopedias);
TEC.1.5.2 identify the Internet as a source for information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Objectives for this standard begin at second grade.

Second Grade Technology Standards and Objectives

The second grade student will begin to practice correct keyboarding and basic operations. The student will expand use of productivity tools, and understand the ownership of computer-generated works. The students will begin to explore the purpose of software programs to collaboratively gather information. The second grade student will begin to locate electronic information independently. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.2.1.1 demonstrate correct keyboarding posture and finger placement for the home row and upper and lower case letters;
TEC.2.1.2 utilize the skill of right clicking with a mouse;
TEC.2.1.3 handle and use diskettes and CD's with care.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.2.2.1 recognize an individual's rights of ownership to computer-generated work.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.2.3.1 use a word processing program, to create, save, print and open existing files;
TEC.2.3.2 enter data and create graphs electronically as a group activity.
TEC.2.3.3 identify and use electronic drawing/paint programs to combine graphics and text.

Standard 4: Technology Communication Tools (TEC.S.4)
Objectives for this standard begin at third grade.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.2.5.1 begin to locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.2.5.2 discuss, as a group, how the Internet and email are tools to gather and locate information.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.2.6.1 begin to identify the different purposes among software applications (e.g., puzzles, writing tools, graphing tools).

Third Grade Technology Standards and Objectives

The third grade student will continue to practice correct keyboarding skills and basic operations. The student will use word processing and spreadsheet applications and explore databases and presentation software. The third grade student will understand the use of email as a communication tool. The student will continue to expand use of appropriate technology resources, looking at book-marked locations and evaluating their usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.3.1.1 demonstrate correct keyboarding posture and finger placement for the home row keys and symbol keys (e.g., period, question marks caps lock, arrow keys, shift, esc, plus, minus, equal, dollar signs);

TEC.3.1.2 handle diskettes, CDs, zip disks, and other computer equipment with care.

Performance Descriptors (TEC.PD.3.1)

- **Mastery**
  Third grade students performing at the mastery level use input and output devices to successfully operate computers.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.3.2.1 recognize that the copyright law protects the electronic products that a person, group, or company has created.

Performance Descriptors (TEC.PD.3.2)

- **Mastery**
  Third grade students performing at the mastery level demonstrate positive social and ethical behaviors when using technology; practice responsible use of technology systems and software.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.3.3.1 use a word processor to enter text with some formatting (e.g., boldface, underlining and font size), cut and paste, spell check, and edit text;

TEC.3.3.2 begin to enter and graph data electronically;

TEC.3.3.3 organize and arrange information for a multi-media presentation as a group activity.

Performance Descriptors (TEC.PD.3.3)

- **Mastery**
  Third grade students performing at the mastery level use a variety of media and technology resources for directed and independent learning activities; create developmentally appropriate multimedia products with support from teachers, family members, or student partners; use technology resources (e.g., puzzles, logical thinking programs, writing tools, drawing tools) for illustration of thoughts, ideas, and stories.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.3.4.1 understand the use of email as a communication tool;
TEC.3.4.2 participate in a curriculum-based telecommunications project as a group activity.

Performance Descriptors (TEC.PD.3.4)

- **Mastery**
  Third grade students performing at the mastery level gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners; use technology resources for communication (i.e., email).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.3.5.1 locate information in a variety of developmentally appropriate technology resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.3.5.2 use bookmarked URL's as a tool for locating information.

Performance Descriptors (TEC.PD.3.5)

- **Mastery**
  Third grade students performing at the mastery level use technology resources for gathering information (bookmarked URL's and multimedia encyclopedias).

Standard 6: Technology Problem-solving and Decision-making Tools
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives (TEC.S.6)
Students will:
TEC.3.6.1 discuss, as a group, appropriate technology tools to perform a task.

Performance Descriptors (TEC.PD.3.6)

- **Mastery**
  Third grade students performing at the mastery level use technology resources (e.g., puzzles, logical thinking programs) for problem solving.

Fourth Grade Technology Standards and Objectives

The fourth grade student will demonstrate some proficiency in proper keyboarding skills. The student will understand the meaning of acceptable use and personal responsibility in the use of technology. The student will continue to expand the use of word processing software, begin to use a spreadsheet to perform calculations, understand the functionality of a database and create a simple multi-media project as a group. The fourth grade student will begin to understand telecommunications, to select appropriate electronic tools such as search engines, and use software for problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.4.1.1 demonstrate with some proficiency proper finger placement for all keys on the keyboard;
TEC.4.1.2 troubleshoot simple problems in software (e.g., reboot, use help systems).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.4.2.1 identify the need for acceptable use policies (AUP);
TEC.4.2.2 identify violations of the copyright law and recognize correct use of copyrighted materials in electronic products.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.4.3.1 use a word processing program to create and format a document (e.g., paragraph, tabs, justification, margins) and review cut and paste, spell check and text formatting;
TEC.4.3.2 enter data into a prepared spreadsheet to perform calculations and recognize the changes that occur;
TEC.4.3.3 create a multi-media project as a class group activity.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.4.4.1 participate in several curriculum-based telecommunication projects as class activities. (e.g., web quests, ask an expert, collaborative email projects).

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.4.5.1 select and use appropriate software and/or other technologies to locate and acquire information from electronic resources (interactive books, educational software and elementary multimedia encyclopedias);
TEC.4.5.2 explore grade level appropriate search engines as tools to locate information electronically;
TEC.4.5.3 evaluate information found via telecommunications for content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.4.6.1. apply, in a group situation, software programs to solving problems (e.g., word processors, graphing programs, other special purpose programs).

Fifth Grade Technology Standards and Objectives

The fifth grade student will use touch-typing skills to improve speed and accuracy. Students will practice responsible use of technology systems, information and software. The student will use the editing functions of word processing software, perform simple calculations using spreadsheets, locate and use information in a simple electronic database, and begin to use presentation software. Fifth grade students will use telecommunications for a curriculum based telecommunications project and continue to evaluate electronic information for appropriateness, content, and usefulness. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.5.1.1 use touch typing skills to improve speed and accuracy;
TEC.5.1.2 diagnose and solve common technology problems;
TEC.5.1.3 manage and maintain technology tools (i.e., properly shut down system).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.5.2.1 describe the use of acceptable use policy (AUP);
TEC.5.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:
TEC.5.3.1 use the editing functions of a word processor (e.g. spell check, grammar check, thesaurus) and review paragraph, tabs, justification, margins;
TEC.5.3.2 create/modify and use spreadsheets to perform simple calculations (+,-,*,/);
TEC.5.3.3 begin to use presentation software; use design template to create a minimum of 3 slides.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.5.4.1 Participate in curriculum-based telecommunication projects as a class activity.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.5.5.1 use telecommunications to locate information as a group/class project;
TEC.5.5.2 evaluate information found via telecommunications for appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.5.6.1 select the appropriate technology resource to solve problems in content area.

Sixth Grade Technology Standards and Objectives

The sixth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. Students will understand the issues related to protection of software and hardware. The student will model ethical behavior in the use of technology systems, information and software. Students will use advanced features of word processing software, enter and edit data in a spreadsheet, collaboratively develop a simple database, and use presentation software with appropriate design layouts. The student will continue to use telecommunications to gather information and evaluate information for appropriateness, content and usefulness. The student will use technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.6.1.1 use touch typing skills to improve speed and accuracy;
TEC.6.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.6.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.6.1)
- **Mastery**
  Sixth grade students performing at the mastery level use keyboards and other common input and output devices efficiently and effectively.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:
- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:
TEC.6.2.1 model ethical behavior relating to security, privacy, passwords and personal information;
TEC.6.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.6.2)
- **Mastery**
  Sixth grade students performing at the mastery level model responsible use of technology and information and describe personal consequences of inappropriate use.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.6.3.1 use advanced features and utilities of a word processor (e.g., bullets, tables, find and replace) and review spell check, grammar check, thesaurus;

TEC.6.3.2 enter and edit data into a prepared spreadsheet to test simple "what-if?" statements and equations;

TEC.6.3.3 use presentation software demonstrating appropriate design layouts and formatting features (e.g., fonts, color, background designs) to effectively communicate.

Performance Descriptors (TEC.PD.6.3)

- **Mastery**
  Sixth grade students performing at the mastery level use general purpose productivity tools and peripherals to support personal productivity, develop organizational skills, remediate skill deficits, and facilitate learning throughout the curriculum; use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences, inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.6.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Performance Descriptors (TEC.PD.6.4)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications efficiently and effectively to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.6.5.1 develop a search strategy using keywords that define the topic;

TEC.6.5.2 evaluate information found via telecommunications for validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.6.5)

- **Mastery**
  Sixth grade students performing at the mastery level use telecommunications and online resources to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom; evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.6.6.1 use technology resources for problem solving, self-directed learning, and extended learning activities.

Performance Descriptors (TEC.PD.6.6)

- **Mastery**
  Sixth grade students performing at the mastery level determine when technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Seventh Grade Technology Standards and Objectives

The seventh grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will use advanced features and utilities of word processing software, select appropriate spreadsheet functions to solve problems, create a database as a group activity, and use presentation software with graphics. The seventh grade student will use telecommunication tools to collaborate, publish and interact with peers, experts and other audiences. The student will produce a product using online sources, evaluate the information, and use other technology resources for self-directed problem solving. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.7.1.1 use touch typing skills to improve speed and accuracy;
TEC.7.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.7.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Standard 2: Social, Ethical and Human Issues (TEC.S.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.7.2.1 model ethical behavior relating to security, privacy, passwords, and personal information;

TEC.7.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Standard 3: Technology Productivity Tools (TEC.S.3)
Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives
Students will:

TEC.7.3.1 use the advanced features and utilities of a word processor (e.g., help menu, toolbars) and review bullets, tables, grammar check, find and replace;

TEC.7.3.2 select appropriate spreadsheet functions to organize data and solve problems;

TEC.7.3.3 use presentation software demonstrating the use of animation and graphics.

Standard 4: Technology Communication Tools (TEC.S.4)
Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:

TEC.7.4.1 use telecommunication tools to collaborate with an expert in gathering information for a class assignment.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:

TEC.7.5.1 produce a product using online sources;

TEC.7.5.2 evaluate information found from electronic sources for validity, appropriateness, content and usefulness.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:

- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:

TEC.7.6.1 use appropriate computer-based productivity tools to create and modify solutions to problems.

Eighth Grade Technology Standards and Objectives

The eighth grade student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. Students will begin to integrate two or more productivity tools into a document and use expanded features of spreadsheet, database and presentation software. Eighth grade students will use telecommunications to publish information and produce a project using online and non-electronic resources. The student will evaluate the information and cites its source. The student will select and use technology tools to solve problems and make decisions related to content areas. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:

- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:

TEC.8.1.1 use touch typing skills to improve speed and accuracy;
TEC.8.1.2 recognize the need for protection of software and hardware from computer viruses and vandalism;
TEC.8.1.3 continue to manage and maintain technology tools (e.g., properly shut down system(s), load printer paper).

Performance Descriptors (TEC.PD.8.1)

- **Mastery**
  Eighth grade students performing at the mastery level apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; demonstrate an understanding of concepts underlying hardware, software, and connectivity.

Standard 2: Social, Ethical and Human Issues (TEC.8.2)
Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives
Students will:

TEC.8.2.1 model ethical behavior relating to security, privacy, passwords and personal information;

TEC.8.2.2 demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects and multimedia presentations.

Performance Descriptors (TEC.PD.8.2)

- **Mastery**
  Eighth grade students performing at the mastery level exhibit legal and ethical behaviors when using information and technologies and discuss consequences of misuse.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.8.3.1 integrate two or more productivity tools into a document including, but not limited to tables, charts, graphs, inserting hyperlinks, and graphics;
TEC.8.3.2 use spreadsheets to explore various formulas, functions and relationships;
TEC.8.3.3 begin to use databases relevant to class assignments;
TEC.8.3.4 use presentation software's advanced features such as inserting pictures, charts, objects and hyperlinks.

Performance Descriptors (TEC.PD.8.3)

- **Mastery**
  Eighth grade students performing at the mastery level use content-specific tools, software and simulations to support learning; apply productivity tools and peripherals to support personal productivity, organizational skills, group collaboration, and learning throughout the curriculum; design, develop, publish and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives

Students will:

TEC.8.4.1 use telecommunications to share and publish information (e.g., email attachments, web pages).

Performance Descriptors (TEC.PD.8.4)

- **Mastery**
  Eighth grade students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)

Students will:

- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report results;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.8.5.1 produce a product using online sources combined with other resources;
TEC.8.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.8.5)
- **Mastery**
  Eighth grade students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.8.6.2 select and use technology tools to solve problems and make decisions related to content areas.

Performance Descriptors (TEC.PD.8.6)
- **Mastery**
  Eighth grade students performing at the mastery level select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems; demonstrate an understanding of practical applications of technology to learning and problem solving.

Ninth - Twelfth Grade Technology Standards and Objectives

The high school student will demonstrate proficiency in the use of technology and a sound understanding of the nature and operation of technology systems. The student will practice responsible use of technology systems, information and software. The student will integrate advanced technology application skills in the use of word processor, database, spreadsheet and presentation software. The student will select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to classroom assignments. The high school student will use telecommunications and a variety of media and formats to communicate information effectively to multiple audiences. The student will use technology resources for solving problems and making informed decisions. The student will use resources provided through statewide technology resources.

Standard 1: Basic Operations and Concepts (TEC.S.1)
Students will:
- demonstrate a sound understanding of the nature and operation of technology systems;
- demonstrate proficiency in the use of technology.

Basic Operations and Concepts Objectives
Students will:
TEC.9-12.1.1 use data input skills appropriate to the task;
TEC.9-12.1.2 demonstrate knowledge and appropriate use of hardware components, software programs, and their connections.

Performance Descriptors (TEC.PD.9-12.1)

- **Mastery**
  High school students performing at the mastery level make informed choices among technology systems, resources, and services.

Standard 2: Social, Ethical and Human Issues (TEC.S.2)

Students will:

- demonstrate understanding of the ethical, cultural, and societal issues related to technology;
- practice responsible use of technology systems, information, and software;
- develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Social, Ethical and Human Issues Objectives

Students will:

TEC.9-12.2.1 practice ethical behavior in using computer-based technology for class assignments and projects;

TEC.9-12.2.2 adhere to Fair Use and Multimedia Copyright Guidelines, citing sources of copyrighted materials in papers, projects and multi-media presentations.

Performance Descriptors (TEC.PD.9-12.2)

- **Mastery**
  High school students performing at the mastery level demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Standard 3: Technology Productivity Tools (TEC.S.3)

Students will:

- use technology tools to enhance learning, increase productivity, and promote creativity;
- use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

Technology Productivity Tools Objectives

Students will:

TEC.9-12.3.1 integrate advanced technology application skills in the use of the word processor, database and spreadsheet;

TEC.9-12.3.2 select and use appropriate technology tools to efficiently collect, analyze and display data that is relevant to class assignments;

TEC.9-12.3.3 practice and refine knowledge and skills in databases in preparing classroom assignments and projects;

TEC.9-12.3.4 create, publish, and present projects related to content areas using a variety of technological tools.

Performance Descriptors (TEC.PD.9-12.3)

- **Mastery**
  High school students performing at the mastery level use technology tools and resources for managing and communicating personal/professional information; use technology to compile, synthesize, produce and disseminate information, models, and other creative works.

Standard 4: Technology Communication Tools (TEC.S.4)

Students will:

- use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences;
- use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Technology Communication Tools Objectives
Students will:
TEC.9-12.4.1 use telecommunications and online resources for the purpose of communicating with audiences inside and outside of the classroom.

Performance Descriptors (TEC.PD.9-12.4)
- **Mastery**
  High school students performing at the mastery level collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.

Standard 5: Technology Research Tools (TEC.S.5)
Students will:
- use technology to locate, evaluate, and collect information from a variety of sources;
- use technology tools to process data and report result;
- evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

Technology Research Tools Objectives
Students will:
TEC.9-12.5.1 use a variety of strategies to acquire information from electronic resources;
TEC.9-12.5.2 conduct online research and evaluate the information found as to the validity, appropriateness, content and usefulness.

Performance Descriptors (TEC.PD.9-12.5)
- **Mastery**
  High school students performing at the mastery level research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems; routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity.

Standard 6: Technology Problem-solving and Decision-making Tools (TEC.S.6)
Students will:
- use technology resources for solving problems and making informed decisions;
- employ technology in the development of strategies for solving problems in the real world.

Technology Problem-solving and Decision-making Tools Objectives
Students will:
TEC.9-12.6.1 investigate and apply expert systems, intelligent agents, and simulations in real world situations.

Performance Descriptors (TEC.PD.9-12.6)
- **Mastery**
  High school students performing at the mastery level select and apply technology tools for research, information analysis, problem solving, and decision-making in content learning.

Foreword

The West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520: *Content Standards and Objectives for West Virginia Schools.*

Committees of educators from across the state gathered to work on curriculum refinement. The committees incorporated content based on the most current research, national standards and best teaching practices in the field. Primary issues that have been addressed in the current revision work are building a rigorous and challenging curriculum, ensuring a curriculum that is accessible to every student, and designing a format that can easily be used and understood.

West Virginia educators have played a key role in shaping the content standards. Their contribution was critical in creating a policy that is meaningful for the classroom.

A primary change in Policy 2520 is that each content area begins with a set of content standards. Grade-level objectives are then organized under the standards, so that the focus stays on helping students achieve the comprehensive goals, not just mastering the incremental steps. The objectives (those incremental steps) are still there--curriculum committees worked very hard to consolidate, delete, sequence, and clarify as needed to produce a picture of the curriculum that is clear in its intent and manageable in its implementation.

Another change is the addition of performance descriptors. Performance descriptors answer the question "How well does the student perform on the content standards at any given grade level?" (See "Explanation of Terms" section for further discussion of this topic.)

The content standards, objectives and performance descriptors combine to give teachers a powerful resource for planning instruction. The sequencing of the grade level objectives and the levels of performance descriptors acknowledge that students acquire skills and knowledge in increments and at different rates. The focus throughout the document remains on achieving at a high level and on offering all students in West Virginia rigor and challenge.

David Stewart
State Superintendent of Schools

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Explanation of Terms

Content Standards (or Instructional Goals) are broad descriptions of what students should know and be able to do in a content area. Content standards describe what students' knowledge and skills should be at the end of a K-12 sequence of study.

Objectives are incremental steps toward accomplishment of content standards. Objectives are listed by grade level and are organized around the content standards. Objectives build across grade levels as students advance in their knowledge and skills.

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. Three performance levels have been proposed for West Virginia: distinguished, mastery, and partial mastery. A general description of each of these categories is listed below:

- **Distinguished**: Superior performance that goes beyond grade level or course expectations.
- **Mastery:** Solid academic performance at the grade level or in the course. Students demonstrate competency in challenging subject matter, can apply knowledge and skills to real-world situations, and can use analytical skills appropriate to the subject matter.
- **Partial Mastery:** Incomplete mastery of prerequisite knowledge and skills that are necessary for success at the grade level or in the course.

Performance Descriptors serve two functions.. Instructionally, they give teachers more information about the level of knowledge and skills they are building in their students. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

Note: The content standards and objectives for Technical and Adult Education do not include performance descriptors.

Numbering of Standards

The number for each content standard is composed of three parts, each part separated by a period:

- The content area code (e.g., MA for Mathematics, RLA for Reading and English Language Arts, the WVEIS course code for technical courses);
- The letter S, for Standard; and
- The standard number.

Illustration: RLA.S.1 refers to Reading and English Language Arts content standard #1. 0101.S.1 refers to Agriculture and Natural Resources I content standard #1.

Numbering of Objectives

The number of each objective is composed of four parts, each part separated by a period:

- The content area code or course code (e.g., PS for Probability and Statistics, HAP for Human Anatomy and Physiology, the WVEIS code for technical courses);
- The grade level (Exceptions are elementary West Virginia Studies, which uses **WV** instead of grade level; and high school mathematics courses, ~~and~~ grades 11-12 science courses, and technical courses, which use no grade designation);
- The number of the content standard addressed; and

- The objective number.

Illustration: RLA.6.2.3 refers to a Reading and English Language Arts sixth grade objective that addresses standard #2 in Reading and English Language Arts, and that is the third objective listed under that standard. 0101.1.1 refers to Agriculture and Natural Resources I content standard #1, objective #1.

Numbering of Performance Descriptors

The number for each group of three performance descriptors is composed of four parts, each part separated by a period:

- The content area code;
- The letters PD, for Performance Descriptors;
- The grade level; and
- The standard number.

Illustration: SS.PD.9.2 refers to Social Studies performance descriptors for ninth grade, content standard 2.

Unique Electronic Numbers (UENs)

Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520 is available on the Web, each standard, each objective, and each group of three performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520 is approved by the State Board of Education. The date is not explicitly printed in the document but it is assumed to be part of every UEN. As sections of 2520 are revised, UENs will be changed to reflect the new approval date.

The prefix for the UENs in this ~~version~~ section of Policy 2520 is ~~"200112."~~ "200207, indicating that the Board approval date is ~~December 2001~~ July, 2002.

UENs (Unique Electronic Numbers) are unique numbers that facilitate implementation of WV Standards into Electronic formats such as Databases and XML Files. The WV Department of Education encourages everyone who is going to use the WV Content Standards in any kind of electronic distribution, alignment, or software development to use the UENs so that all efforts can be cross-referenced and there is consistency across initiatives.

Illustration: The UEN for performance descriptors for fifth grade science, standard #2 will be "200112.SC.PD.5.2".

Abbreviations

Content Areas

MA Mathematics
RLA Reading and English Language Arts
SC Science
SS Social Studies
TEC Technology

Elementary School

WV West Virginia Studies, K-4

High School Courses

Mathematics

AGP Algebra/Geometry Preparation
AI Algebra
AM1 Applied Mathematics I
AM2 Applied Mathematics II
G Geometry and Applied Geometry
A2 Algebra II
CM Conceptual Mathematics
T Trigonometry
PS Probability and Statistics
PC Pre-calculus

Science

AB Advanced Biology (11/12)
BTC Biology - Technical Conceptual (11/12)
HAP Human Anatomy and Physiology (11/12)
AC Advanced Chemistry (11/12)
CTC Chemistry - Technical Conceptual (11/12)
AES Advanced Environmental Earth Science (11/12)
AP Advanced Physics (11/12)
PTC Physics - Technical Conceptual (11/12)

Other Abbreviations

PD Performance Descriptors
S Standard (Content Standard)

Agriculture and Natural Resources I

This area of study is designed to provide students with core skills and competencies needed for pursuing careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Orientation to the Agriculture and Natural Resource Industries (0101.S.1)
Students will:

- describe the natural resource industry.

Agriculture and Natural Resource Industries Objectives
Students will:

0101.1.1 Identify appropriate career opportunities in agriculture and natural resources.
0101.1.2 Relate the importance of agriculture and natural resources to state, national and international economies.
0101.1.3 Identify major agricultural and natural resources issues.
0101.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Leadership in Agriculture and Natural Resources (0101.S.2)
Students will:

- show leadership skills necessary for success in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0101.2.1 Participate in meetings using parliamentary law.
0101.2.2 Use interpersonal skills in team problem solving.
0101.2.3 Prepare and deliver a brief presentation on an agricultural or natural resources topic.

Standard 3: Developing Work-Based Experience Program (0101.S.3)
Students will:

- develop work-based experience programs in agriculture and natural resources.

Developing Work-Based Experience Program Objectives
Students will:

0101.3.1 Define and explain supervised experience programs in agriculture and natural resources.
0101.3.2 Explore opportunities for work-based experiences through supervised experience programs.
0101.3.3 Define record keeping terms for supervised experience programs.
0101.3.4 Complete budgets for potential supervised experience programs.
0101.3.5 Establish a supervised experience program in agriculture or natural resources.
0101.3.6 Utilize marketing principles.
0101.3.7 Demonstrate competency in agriscience problem solving.

Standard 4: Computer Applications in Agriculture and Natural Resources (0101.S.4)
Students will:

- Display skills involving computer application in natural recourses.

Computer Applications in Agriculture and Natural Resources Objectives
Students will:

0101.4.1 Utilize keyboarding skills to operate agriculture and natural resources software.
0101.4.2 Search the Internet to secure agriculture and natural resources information.

Standard 5: Applying Basic Mechanical Skill in Agriculture and Natural Resources (0101.S.5)
Students will:

- demonstrate basic mechanical skills.

Basic Mechanical Skill in Agriculture and Natural Resources Objectives
Students will:
0101.5.1 Demonstrate principles of safety.
0101.5.2 Demonstrate basic tool conditioning skills.
0101.5.3 Demonstrate basic carpentry skills.
0101.5.4 Demonstrate basic welding skills.
0101.5.5 Demonstrate basic cold metal skills.

Standard 6: Introductory Animal Science and Production (0101.S.6)
Students will:
- demonstrate animal science and production skills.

Animal Science and Production Objectives
Students will:
0101.6.1 Explore various animal production opportunities.
0101.6.2 Explain management/health requirements of animals.
0101.6.3 Identify desirable characteristics for selecting large and small animals.
0101.6.4 Identify different types of animal digestive systems.

Standard 7: Introductory Plant Science and Production (0101.S.7)
Students will:
- demonstrate plant science and production skills.

Introductory Plant Science and Production Objectives
Students will:
0101.7.1 Explore various plant production opportunities.
0101.7.2 Explain plant production requirements (macronutrients, micronutrients, pH).
0101.7.3 Identify the major parts of a plant.
0101.7.4 Describe the function of the major parts of a plant.

Standard 8: Basic Environmental Concerns (0101.S.8)
Students will:
- demonstrate basic environmental skills.

Basic Environmental Concerns Objectives
Students will:
0101.8.1 Explain major environmental concerns - e.g. acid rain, air pollution, soil degradation and surface and groundwater pollution.
0101.8.2 Use measurement devices to collect and test soil and water samples.
0101.8.3 Explain the concepts of soil science and their relationship to agriculture.

Standard 9: Investigations and Problem Solving (0101.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0101.9.1 Engage in hands-on activities demonstrating agriscience and natural resources concepts and principles.

Agriculture and Natural Resources II

This area of study is designed to provide students with core skills and competencies needed for pursuing advanced careers in agriculture and natural resources. Students will utilize problem-solving techniques and participate in laboratory activities to develop an understanding of course concepts.

Standard 1: Developing Work Based (0102.S.1)
Students will:

- develop a work based experience program.

Developing Work Based Objectives
Students will:

0102.1.1 Analyze records of supervised experience programs to make sound decisions for expanding.
0102.1.2 Identify marketing trends and cycles.
0102.1.3 Identify employment trends and cycles.
0102.1.4 Identify the scientific principles in food and fiber production.

Standard 2: Computer Applications (0102.S.2)
Students will:

- utilize computer applications in agriculture and natural resources.

Computer Applications Objectives
Students will:

0102.2.1 Use computer resources to solve problems related to work-based experience programs.

Standard 3: Ecosystem Management (0102.S.3)
Students will:

- understand ecosystem management.

Ecosystem Management Objectives
Students will:

0102.3.1 Explain the impact of agriculture and forestry on ecosystems.
0102.3.2 Explain the relationship of wetlands to agriculture and natural resources.
0102.3.3 Test, interpret and analyze water and soil test data.

Standard 4: Leadership in Agriculture and Natural Resources (0102.S.4)
Students will:

- display leadership skills in agriculture and natural resources.

Leadership in Agriculture and Natural Resources Objectives
Students will:

0102.4.1 Conduct meetings using parliamentary law.
0102.4.2 Serve as a small group team leader.
0102.4.3 Present prepared and extemporaneous speeches on issues affecting agriculture and natural resources.
0102.4.4 Participate in committees and leadership development activities.
0102.4.5 Participate in committee service.

Standard 5: Application of Mechanical Skills (0102.S.5)
Students will:

- apply mechanical skills to augment agriculture and natural resource activities.

Application of Mechanical Skills Objectives
Students will:
0102.5.1 Read and transfer measurements.
0102.5.2 Develop bill of materials and calculate costs.
0102.5.3 Demonstrate advanced tool conditioning skills.
0102.5.4 Demonstrate advanced welding skills.
0102.5.5 Demonstrate building construction skills.
0102.5.6 Service and maintain small engines.
0102.5.7 Apply mechanical skills in repair and construction projects related to supervised experience programs.

Standard 6: Advanced Animal Science and Production (0102.S.6)
Students will:
- demonstrate advanced animal science reproduction skills.

Advanced Animal Science and Production Objectives
Students will:
0102.6.1 Compare animal digestive systems.
0102.6.2 Analyze nutrient requirements of animals and calculate rations.
0102.6.3 Identify symptoms of nutrient deficiencies.
0102.6.4 Describe the use of feed additives and growth stimulants.
0102.6.5 Explain the role of breeding and selection in animal improvement.
0102.6.6 Recognize steps to maintain animal health.
0102.6.7 Explain biotechnology applications in animal production.

Standard 7: Advanced Plant Science and Production (0102.S.7)
Students will:
- demonstrate advanced plant science and production skills.

Advanced Plant Science and Production Objectives
Students will:
0102.7.1 Describe approved practices in plant nutrition.
0102.7.2 Identify symptoms and management strategies for plant nutrient deficiencies.
0102.7.3 Identify pest management measures.
0102.7.4 Explain biotechnology applications in plant production.

Standard 8: Forestry (0102.S.8)
Students will:
- exhibit skills enhancing selective forestry activities.

Forestry Objectives
Students will:
0102.8.1 Identify trees of major economic importance.
0102.8.2 Identify relationships among forests, wildlife and water resources.
0102.8.3 Select best management practices for timber stand improvement.

Standard 9: Investigations and Problem Solving (0102.S.9)
Students will:
- participate in investigations and problem solving in agriscience.

Investigations and Problem Solving Objectives
Students will:
0102.9.1 Students will engage in advanced hands-on activities relating to agriscience and natural resources concepts.

Agriculture Mechanics I

This area of study is designed to provide learners with job entry-level skills in the agricultural mechanics industry. Major instructional concepts include an orientation to mechanics industry, leadership, safety, drawing and blueprinting, shop, hand and power tools.

Standard 1: Orientation to the Agricultural Mechanics Industry (0112.S.1)
Students will:

- describe mechanics as a career.

Agricultural Mechanics Industry Objectives
Students will:
0112.1.1 Identify various career opportunities in agricultural mechanics.
0112.1.2 Develop computer skills.
0112.1.3 Develop resume and job seeking skills.

Standard 2: Leadership in Agricultural Mechanics (0112.S.2)
Students will:

- participate effectively in a group (FFA) setting.

Leadership in Agricultural Mechanics Objectives
Students will:
0112.2.1 Define the function and history of the FFA.
0112.2.2 Identify parliamentary procedure skills need to conduct a meeting.
0112.2.3 Perform individual leadership skills in preparing and presenting a speech.
0112.2.4 Prepare and identify components of a program of activities.

Standard 3: Understanding Safety and Fire Control Procedures (0112.S.3)
Students will:

- maintain a safe working environment.

Understanding Safety and Fire Control Procedures Objectives
Students will:
0112.3.1 Utilize personal safety devices.
0112.3.2 Identify general shop safety rules.
0112.3.3 Maintaining a safe working environment.
0112.3.4 Identify and comply with safety rules relating to operation of farm tractors and equipment.

Standard 4: Understanding and Interpreting Drawing and Blueprints (0112.S.4)
Students will:

- use blueprints to plan projects.

Understanding and Interpreting Drawing and Blueprints Objectives
Students will:
0112.4.1 Apply dimensions to drawings and free hand sketches.
0112.4.2 Calculate costs and bill of materials.

Standard 5: Using Shop Hand and Power Tools (0112.S.5)
Students will:

- safely and correctly demonstrate metal fabrication.

Using Shop Hand and Power Tools Objectives
Students will:

0112.5.1 Identify and use common hand tools and power equipment.
0112.5.2 Perform cold metal procedures - cutting, drilling and threading.
0112.5.3 Perform various arc-welding functions.
0112.5.4 Perform various oxy-acetylene tasks.
0112.5.5 Conduct arc welding projects that relate to SAEs.

Standard 6: Technology Applications (0112.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0112.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0112.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0112.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural mechanics.
0112.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0112.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:

0112.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0112.7.2 Explore careers available in agricultural mechanics.
0112.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0112.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0112.7.5 Demonstrate correct language usage in all oral and written work.
0112.7.6 Perform effectively in both leadership and non-leadership roles.
0112.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0112.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0112.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives

Students will:

0112.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0112.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0112.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0112.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agricultural Mechanics II

This area of study provides students with more advanced concepts and practical application in the areas of leadership, computer application, ag engines, structures, electricity and fencing.

Standard 1: Introduction to Basic Principles of Agricultural Engines – Gasoline and Diesel (0113 .S.1)
Students will:

- **learn the basic principles of agricultural engines – gasoline and diesel.**

Gasoline and Diesel Objectives
Students will:

0113.1.1 Interpret basic principles of agricultural engines.
0113.1.2 Apply principles of tune-up procedure.
0113.1.3 Perform engine overhauls.
0113.1.4 Demonstrate problem solving in operation and maintenance of engines.
0113.1.5 Identify hydraulic systems.
0113.1.6 Identify and use diagnostic testing equipment.

Standard 2: Agricultural Structures (0113.S.2)
Students will:

- **use agriculture construction techniques.**

Agricultural Structures Objectives
Students will:

0113.2.1 Identify basic building construction techniques related to agricultural structures.
0113.2.2 Select and install appropriate fasteners.
0113.2.3 Select kinds and grades of lumber for the job.
0113.2.4 Identify roof designs and materials.
0113.2.5 Exhibit concrete and masonry skills.
0113.2.6 Identify, select and use plumbing fixtures.
0113.2.7 Select and use various painting and finishing materials.

Standard 3: Agricultural Electricity (0113.S.3)
Students will:

- **use proper safety in electrical wiring.**

Agricultural Electricity Objectives
Students will:

0113.3.1 Demonstrate electrical theory and skills with agricultural electrical units.
0113.3.2 Identify terminology, circuits, breakers, switches and service entrance panels based on state codes.
0113.3.3 Identify, select and use electric motors, motor controls, pulley sizes and speeds.
0113.3.4 Demonstrate proper safety procedures in all electrical work.

Standard 4: Fencing (0113.S.4)
Students will:

- **explore fencing for agricultural applications.**

Fencing Objectives
0113.4.1 Identify and understand the various types of fencing, tools and equipment.

0113.4.2 Analyze the economics of various fencing systems.

Standard 5: Agricultural Equipment (0113.S.5)
Students will:

- **maintain, adjust and repair agricultural equipment.**

Agricultural Equipment Objectives
Students will:

0113.5.1 Identify agricultural machinery and equipment.
0113.5.2 Perform maintenances procedures as recommended in service manuals.
0113.5.3 Identify agricultural lubricants and fuels.

Standard 6: Technology Applications (0113.S.6)
Students will:

- **apply technology to investigate real-world problems.**

Technology Applications Objectives
Students will:

0113.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural mechanics.
- Locate, evaluate, and collect information from a variety of sources related to agricultural mechanics.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0113.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0113.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to a agricultural mechanics.
0113.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of an agricultural mechanics.

Standard 7: Process/Workplace Skills in Agribusiness (0113.S.7)
Students will:

- **demonstrate personal and group workplace skills.**

Process/Workplace Skills in Agribusiness Objectives
Students will:

0113.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0113.7.2 Explore careers available in agricultural mechanics.
0113.7.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural mechanics.
0113.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0113.7.5 Demonstrate correct language usage in all oral and written work.
0113.7.6 Perform effectively in both leadership and non-leadership roles.
0113.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0113.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Lab Investigation (0113.S.8)
Students will :

- **safely conduct laboratory investigations and exploratory learning.**

Lab Investigation Objectives

Students will:

0113.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0113.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0113.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0113.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Agribusiness Management

Agribusiness management is for students who seek further agriculture, business, advancement and management techniques that will enable them to become successful in owning and operating a business.

Standard 1: Agribusiness Concepts (0131.S.1)
Students will:
- Identify different types of business organizations.

Agribusiness Concepts Objectives
Students will:
0131.1.1 Identify agribusiness organizational structures.
0131.1.2 Distinguish between partnership, limited partnership and joint venture.
0131.1.3 Describe regular and sub-chapter S corporations.
0131.1.4 Explain the difference between cooperatives and corporations.

Standard 2: Agripreneurship (0131.S.2)
Students will:
- describe the risks and rewards of becoming an entrepreneur.

Agripreneurship Objectives
Students will:
0131.2.1 Define entrepreneurship.
0131.2.2 Recognize advantages and disadvantages of being self-employed.
0131.2.3 Identify personal characteristics of successful agripreneurs.
0131.2.4 Explain why businesses succeed.

Standard 3: Preparing a Business Plan (0131.S.3)
Students will:
- develop a business plan and technical resources.

Preparing a Business Plan Objectives
Students will:
0131.3.1 Identify and complete the components of a business plan.
0131.3.2 Prepare a cash flow statement for a proposed agribusiness.
0131.3.3 Identify sources of technical assistance in establishing and maintaining a successful business.
0131.3.4 Explain risk management.

Standard 4: Business Law (0131.S.4)
Students will:
- identify the basic business law involved in agriculture.

Business Law Objectives
Students will:
0131.4.1 Identify the types and sources of laws.
0131.4.2 Describe liability and negligence laws.
0131.4.3 Describe health and safety regulations.
0131.4.4 Identify legal requirements and common laws and legal documentation of a successful business operation.

Standard 5: Marketing and Sales Management (0131.S.5)
Students will:

- develop a marketing and sales plan.

Marketing and Sales Management Objectives
Students will:
0131.5.1 Develop and maintain a marketing strategy.
0131.5.2 Explain methods of advertising.
0131.5.3 Identify sources of information in using marketing research.
0131.5.4 Demonstrate successful marketing techniques.

Standard 6: Financial Management (0131.S.6)
Students will:
- develop various financial records of an agribusiness.

Financial Management Objectives
Students will:
0131.6.1 Use computers in maintaining business documents and records.
0131.6.2 Use computers to make sales and business projections.
0131.6.3 Prepare sales literature and advertisements.

Standard 7: Technology Applications in Agribusiness (0131.S.7)
Students will:
- apply technology to investigate real-world problems.

Technology Applications in Agribusiness Objectives
Students will:
0131.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0131.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0131.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0131.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 8: Process/Workplace Skills in Agribusiness (0131.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills in Agribusiness Objectives
Students will:
0131.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0131.8.2 Explore careers available in agribusiness.
0131.8.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0131.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0131.8.5 Demonstrate correct language usage in all oral and written work.
0131.8.6 Perform effectively in both leadership and non-leadership roles.
0131.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0131.8.8 Participate as a team member to complete a variety of assignments.

Agricultural Biotechnology

This course is designed to provide knowledge, skills and competencies regarding the application of biotechnology to agriscience. The course establishes a basic understanding of biotechnology, genetics, and agricultural applications and explores related careers.

Standard 1: Orientation to Biotechnology (0132.S.1)
Students will:

- research application of biotechnology in agriscience.

Biotechnology Objectives
Students will:

0132.1.1 Investigate biotechnology and its applications to agriscience.
0132.1.2 Research the biotechnology industry and make predictions regarding future uses in agriscience and the impact on the industry and consumer.

Standard 2: Genetics and Genetic Engineering (0132.S.2)
Students will:

- describe genetic engineering.

Genetics and Genetic Engineering Objectives
Students will:

0132.2.1 Define and exhibit an understanding of basic genetic terms.
0132.2.2 Explain the concept of habitability.
0132.2.3 Compare and contrast methods of transferring genetic information.
0132.2.4 Relate the concepts of dominant and recessive genes to common heritable traits.
0132.2.5 Explain and simulate recombinant DNA procedures.
0132.2.6 Explain and perform procedures used in tissue culturing.
0132.2.7 Research emerging methods of genetic engineering.
0132.2.8 Properly and safely manipulate equipment and procedures used in performing genetic engineering tasks.

Standard 3: The Application of Biotechnology to Animal Management and Reproduction (0132.S.3)
Students will:

- apply principles of biotechnology to animal production.

Animal Management and Reproduction Objectives
Students will:

0132.3.1 Apply principles of biotechnology to animal selection.
0132.3.2 Apply principles of biotechnology to animal health.
0132.3.3 Apply principles of biotechnology to the management of animal waste.
0132.3.4 Explore the application of artificial insemination in animal science.
0132.3.5 Describe the purposes and procedures of embryo transfer.
0132.3.6 Investigate and discuss the application of biotechnology to estrus manipulation.
0132.3.7 Explore developments in biotechnology regarding gender selection.

Standard 4: The Application of Biotechnology to Plant Propagation, Growth and Development (0132.S.4)
Students will:

- apply principles of biotechnology to plant production.

Plant Propagation, Growth and Development Objectives
Students will:

0132.4.1 Design, conduct, evaluate and revise experiments related to the application of biotechnology to both sexual and asexual plant propagation.
0132.4.2 Perform various tissue culturing techniques.
0132.4.3 Discuss the stages of plant growth and investigate and analyze alterations in plant growth as a result of biotechnology.
0132.4.4 Evaluate the impact of biotechnology on making plants more resistant to insects, diseases and frost.

Standard 5: Laboratory Investigation (0132.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0132.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0132.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0132.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0132.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Ethical Questions Created by Biotechnology (0132.S.6)
Students will:

- demonstrate an understanding of ethical issues associated with biotechnology.

Ethical Questions Created by Biotechnology Objectives
Students will:

0132.6.1 Examine ethical questions raised by biotechnology.
0132.6.2 Distinguish the difference between fact and opinion.

Standard 7: Leadership Development for the Biotechnology Industry (0132.S.7)
Students will:

- research and debate issues in biotechnology.

Biotechnology Industry Objectives
Students will:

0132.7.1 Obtain current information from printed sources and the Internet concerning biotechnology and evaluate for accuracy.
0132.7.2 Debate biotechnology issues.

Standard 8: Technology Applications (0132.S.8)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0132.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agricultural biotechnology.
- Locate, evaluate, and collect information from a variety of sources related to agricultural biotechnology.
- Develop positive attitudes toward technology uses that support lifelong learning,

collaboration, personal pursuits, and productivity.

0132.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0132.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agricultural biotechnology.

0132.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agricultural biotechnology.

Standard 9: Process/Workplace Skills (0132.S.9)

Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives

Students will:

0132.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0132.9.2 Explore careers available in agricultural biotechnology.

0132.9.3 Use a variety of sources to investigate the educational requirements of various careers in agricultural biotechnology.

0132.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0132.9.5 Demonstrate correct language usage in all oral and written work.

0132.9.6 Perform effectively in both leadership and non-leadership roles.

0132.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0132.9.8 Participate as a team member to complete a variety of assignments.

Agricultural Cooperative Education

This course is designed for seniors in agricultural education classes. Students must be their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and receive school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. This course will give students experience in a potential agricultural career.

- **Standard 1: Orientation (0133.S.1)**

Students will:

- prepare for employment

- **Orientation Objectives**

Students will:

0133.1.1 Determine areas of major interest in agriculture (production, agribusiness, entrepreneurship).
0133.1.2 Complete required information sheet and papers for program.
0133.1.3 Identify required policies.
0133.1.4 Establish experience program record-book procedures.
0133.1.5 Establish an appropriate training program and evaluation procedures.

- **Standard 2: Interpersonal Skill Development (0133.S.2)**

Students will:

- develop skills necessary to maintain employment.

- **Interpersonal Skill Development Objectives**

Students will:

0133.2.1 Develop an understanding of employer/employee relationships.
0133.2.2 Establish job-site ethics.
0133.2.3 Describe appropriate dress, etiquette and health habits.
0133.2.4 Determine job skills and responsibilities.
0133.2.5 Budget time effectively for job completion.
0133.2.6 Develop leadership and decision-making skills.
0133.2.7 Demonstrate a courteous attitude to customers, employers and fellow employees.
0133.2.8 Display willingness to learn new techniques and follow directions.

- **Standard 3: Job Site Safety Skills (0133.S.3)**

Students will:

- demonstrate a safety "attitude."

- **Job Site Safety Skills Objectives**

Students will:

0133.3.1 Establish a safe working environment.
0133.3.2 Obtain appropriate training from supervisor using acceptable procedures.
0133.3.3 Identify procedures for reporting safety violations.
0133.3.4 Identify the location of first aid kits, emergency phone numbers and exits.
0133.3.5 Demonstrate proper use of equipment.

- **Standard 4: Career Awareness and Employment Skills (0133.S.4)**

Students will:

- develop documents and skills to obtain employment.

- **Career Awareness and Employment Skills Objectives**

Students will:

0133.4.1 Identify areas of potential career interests.
0133.4.2 Determine contents of job application and complete a letter of application.
0133.4.3 Compose an appropriate job resume.
0133.4.4 Demonstrate job-interviewing skills.
0133.4.5 Identify methods to locate potential jobs.

- **Standard 5: Technology Applications (0133.S.5)**

Students will:

- apply technology to investigate real-world problems.

- **Technology Applications Objectives**

Students will:

0133.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0133.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0133.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0133.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

- **Standard 6: Process/Workplace Skills in Agribusiness (0133.S.6)**

Students will:

- demonstrate personal and group workplace skills.

- **Process/Workplace Skills in Agribusiness Objectives**

Students will:

0133.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0133.6.2 Explore careers available in agribusiness.
0133.6.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0133.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0133.6.5 Demonstrate correct language usage in all oral and written work.
0133.6.6 Perform effectively in both leadership and non-leadership roles.
0133.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0133.6.8 Participate as a team member to complete a variety of assignments.

- **Standard 7: Lab Investigation (0133.S.7)**

Students will:

- safely conduct laboratory investigations and exploratory learning.

- **Lab Investigation Objectives**

Students will:

0133.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0133.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0133.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0133.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

**Credit varies according to school-release time for placement. In most cases, the program will involve 2 hours/3 credits.*

Agricultural Experience Program

Students enrolled in agricultural education courses have the unique opportunity for experiential learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course code provides county school systems the vehicle whereby credit can be awarded for such individual student agricultural experiences occurring as an outgrowth from other agricultural education courses.

Standard 1: Selecting Supervised Agricultural Experience Program (0134.S.1)
Students will:

- Identify and investigate appropriate enterprises for SAE.

Supervised Agricultural Experience Program (SAE) Objectives
Students will:

0134.1.1 Define and explain the meaning and purpose of SAE.
0134.1.2 Complete a personal interest and resource inventory to identify an appropriate potential SAE.
0134.1.3 Explore and become engaged in appropriate agricultural enterprises through placement and/or entrepreneurship.

Standard 2: Maintaining Supervised Agricultural Experience Program Records (0134.S.2)
Students will:

- accurately maintain SAE records.

Supervised Agricultural Experience Program Records Objectives
Students will:

0134.2.1 Explain the types of records utilized in agricultural enterprises.
0134.2.2 Define and demonstrate the use of net worth statements, inventories, income and expense logs and other pertinent financial records.
0134.2.3 Maintain neat and accurate records for individual SAEs.

Standard 3: Evaluating and Improving Supervised Agriculture Experience Program (0134.S.3)
Students will:

- summarize and evaluate progress in individual SAEs.

Evaluating and Improving Supervised Agriculture Experience Program Objectives
Students will:

0134.3.1 Summarize financial records to determine net income from the SAE.
0134.3.2 Calculate efficiency factors related to individual SAEs.
0134.3.3 Explore opportunities for SAE expansion and/or improvement.
0134.3.4 Research and examine career opportunities related to individual SAEs.

Agriscience 11

This area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, and leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Agricultural Buildings And Equipment (0135.S.1)
Students will:

- apply agricultural mechanical skills in solving agriscience problems.

Agricultural Buildings and Equipment Objectives
Students will:

0135.1.1 Compare and contrast fencing systems, materials, tools and management practices.
0135.1.2 Analyze and discuss types of agricultural buildings and related construction.
0135.1.3 Interpret agricultural equipment service manuals and maintenance schedules.
0135.1.4 Perform basic transit procedures.

Standard 2: Pesticide Safety and Management (0135.S.2)
Students will:

- describe basic pesticide safety.

Pesticide Safety and Management Objectives
Students will:

0135.2.1 Investigate and discuss pesticide types and pest control.
0135.2.2 Examine control methods, chemical formulation and equipment used to control pests in the greenhouse.
0135.2.3 Identify information on a pesticide label.
0135.2.4 Explore the safe handling and disposal of pesticides.
0135.2.5 Identify and perform the steps in calibrating a sprayer.
0135.2.6 Research integrated pest management.

Standard 3: Health and Care of Farm Related Animals (0135.S.3)
Students will:

- explain how to maintain animal health.

Health and Care of Farm Related Animals Objectives
Students will:

0135.3.1 Investigate and discuss the symptoms of unhealthy animals.
0135.3.2 Identify and diagnose symptoms of disease and parasites.
0135.3.3 Analyze the treatment and prevention of animal disease.
0135.3.4 Utilize techniques in administering medicine and immunizing.
0135.3.5 Examine the treatment and prevention of animal parasites.
0135.3.6 Identify and illustrate the methods for administering medicines to animals.
0135.3.7 Design and utilize a herd health program.
0135.3.8 Differentiate between animal welfare and animal rights.

Standard 4: Work-based Experiential Programs (Supervised Agricultural Experience Programs) (0135.S.4)
Students will:

- conduct work-based experience programs.

Work-based Experiential Programs Objectives
Students will:
0135.4.1 Complete and summarize record book enterprises related to students Supervised Agricultural Experience Program.
0135.4.2 Calculate efficiency factors related to students Supervised Agricultural Experience Program.

Standard 5: Managing Farm Woodlots (0135.S.5)
Students will:
- describe farm woodlot management.

Managing Farm Woodlots Objectives
Students will:
0135.5.1 Compare and contrast the methods of identifying trees.
0135.5.2 Identify trees common to West Virginia.
0135.5.3 Evaluate major forest type and primary uses.
0135.5.4 Measure tree height and diameter.
0135.5.5 Identify and utilize units of measurement (mile, rod, chair & acre).
0135.5.6 Calculate the number of acres in a timber tract.
0135.5.7 Examine the habitat necessary for wildlife.

Standard 6: Laboratory Investigations/Hands-on Learning (0135.S.6)
Students will:
- safely conduct laboratory investigation and exploratory learning.

Laboratory Investigations/hands-on Learning Objectives
Students will:
0135.6.1 Engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0135.6.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0135.6.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0135.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 7: Leadership Development in Agriscience (0135.S.7)
Students will:
- display leadership skills in Agriscience

Leadership Development in Agriscience Objectives
Students will:
0135.7.1 Conduct meetings using parliamentary law.
0135.7.2 Serve as a small group team leader.
0135.7.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0135.7.4 Engage in committees and leadership development activities.
0135.7.5 Model and exhibit community service.

Standard 8: Principles of Safety (0135.S.8)
Students will:
- demonstrate principles of safety.

Principles of Safety Objectives
Students will:
0135.8.1 Wear appropriate protective gear.
0135.8.2 Maintain a safe working environment.
0135.8.3 Identify and engage in safety practices on the farm and in the work place.

Standard 9: Technology Applications (0135.S.9)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0135.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agriscience.
- Locate, evaluate, and collect information from a variety of sources related to agriscience.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0135.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0135.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agriscience.

0135.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agriscience.

Standard 10: Process/Workplace Skills (0135.S.10)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0135.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0135.10.2 Explore careers available in agriscience.

0135.10.3 Use a variety of sources to investigate the educational requirements of various careers in agriscience.

0135.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0135.10.5 Demonstrate correct language usage in all oral and written work.

0135.10.6 Perform effectively in both leadership and non-leadership roles.

0135.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0135.10.8 Participate as a team member to complete a variety of assignments.

Agriscience 12

The area of agriscience is designed to provide students with knowledge, skills and competencies needed to enter various occupations in agriculture and natural resources. Topics covered in agriscience are animal science, plant science, agricultural mechanics, microcomputer applications, leadership and supervised agricultural experience programs. The program combines knowledge and skills with experiential learning and FFA for a total program effect.

Standard 1: Appling Agriculture Mechanic Skills (0136.S.1)
Students will:

- apply agriculture mechanic skills in solving problems in agriscience.

Appling Agriculture Mechanic Skills Objectives
Students will:

0136.1.1 Tune-up and perform maintenance procedures on agricultural engine driven machines.
0136.1.2 Perform basic electrical wiring skills.
0136.1.3 Adjust and maintain hay equipment.
0136.1.4 Form, mix, pour and finish concrete.

Standard 2: Land Use Capabilities and Soil Conservation (0136.S.2)
Students will:

- demonstrate land use capabilities and soil conservation in agriscience.

Land Use Capabilities and Soil Conservation Objectives
Students will:

0136.2.1 Evaluate and classify soils according to land use factors.
0136.2.2 Define and determine physical properties of soil.
0136.2.3 Recommend land use and soil conservation practices.
0136.2.4 Test soil and analyze fertility recommendations.
0136.2.5 Explain the function and management of soil pH.
0136.2.6 Describe the process of soil testing.
0136.2.7 Interpret and apply data generated by soil testing.

Standard 3: Landscape Design and Turfgrass Management (0136.S.3)
Students will:

- engage in activities in landscape design and turfgrass management.

Landscape Design and Turfgrass Management Objectives
Students will:

0136.3.1 Identify turfgrass species, purposes and desired locations.
0136.3.2 Explain steps for turfgrass establishment.
0136.3.3 Calculate fertilizer application rates.
0136.3.4 Identify common turf insects, weeds, diseases and biological control.
0136.3.5 Identify ornamental tree and shrubs.
0136.3.6 Select trees and shrubs for appropriate landscape use.
0136.3.7 Install and maintain landscape plant materials.

Standard 4: Animal Reproduction (0136.S.4)
Students will:

- display a working knowledge of animal reproduction.

Animal Reproduction Objectives
Students will:
0136.4.1 Describe genetic principles of animal breeding.
0136.4.2 Identify parts of the male and female reproductive tracts.
0136.4.3 Explain the estrus cycle and gestation period of farm animals.
0136.4.4 Describe techniques of artificial insemination, embryo transplant and pregnancy testing.
0136.4.5 Select breeding stock using performance test data.
0136.4.6 Identify biotechnology implications for animal production.

Standard 5: Farm and Agribusiness Financing (0136.S.5)
Students will:
- engage in activities to augment the understanding of farm and agribusiness financing.

Farm and Agribusiness Financing Objectives
Students will:
0136.5.1 Describe the economic principles of supply and demand.
0136.5.2 Identify sources of credit.
0136.5.3 Calculate simple interest on a loan.
0136.5.4 Explain income tax requirements.
0136.5.5 Identify the functions of government agricultural agencies and programs.
0136.5.6 Describe the steps in planning an agribusiness.

Standard 6: Employment Skills (0136.S.6)
Students will:
- conduct activities designed to enhance employment skills.

Employment Skills Objectives
Students will:
0136.6.1 Identify personal traits necessary to secure and maintain a job.
0136.6.2 Initiate a job search.
0136.6.3 Develop a resume.
0136.6.4 Complete a job application.
0136.6.5 Participate in simulated job interviews.

Standard 7: Work Based Experience (0136.S.7)
Students will:
- conduct activities designed to enhance employment skills.

Work Based Experience Objectives
Students will:
0136.7.1 Complete and summarize record book enterprises related to students supervised agricultural experience program.
0136.7.2 Calculate efficiency factors related to students supervised agricultural experience program.

Standard 8: Computer Application (0136.S.8)
Students will:
- engage in computer applications in agriscience.

Computer Application Objectives
Students will:
0136.8.1 Use computer resources to solve problems related to work-based experience programs.

Standard 9: Leadership in Agriscience (0136.S.9)
Students will:

- develop leadership skills in agriscience.

Leadership in Agriscience Objectives
Students will:
0136.9.1 Conduct meetings using parliamentary law.
0136.9.2 Serve as a small group team leader.
0136.9.3 Present prepared and extemporaneous speeches on issues affecting agriscience.
0136.9.4 Participate in committee and leadership development activities.
0136.9.5 Participate in community services.

Standard 10: Safety (0136.S.10)
Students will:
- demonstrate principles of safety.

Safety Objectives
Students will:
0136.9.1 Wear appropriate protective gear.
0136.9.2 Maintain a safe working environment.
0136.9.3 Identify safety practices on the farm and in the work place.

Animal And Veterinary Science – Large Animals

This course is designed to give students advanced knowledge of veterinary science, which includes the study of large farm animals (horses, cattle, sheep, goats and swine). This course will provide an understanding of breeds, animal health, nutrition, anatomy and physiology, training, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of large animals and their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0137.S.1)
Students will participate in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0137.1.1 Participate in committee and leadership development activities associated with FFA.
0137.1.2 Complete and summarize records of SAE Program and health program on individual animals.
0137.1.3 Shadow appropriate career opportunities in Veterinary Medicine.
0137.1.4 Initiate a job search and complete application for entry into college level programs in Veterinary Science.
0137.1.5 Develop communication skills through prepared and extemporaneous speaking.

Standard 2: History And Selection of Farm Animals (0137.S.2)
Students will examine the history and selection of farm animals.

History and Selection of Farm Animals Objectives
Students will:
0137.2.1 Trace the history of domestic farm animals and relate it to human and animal health.
0137.2.2 Classify farm animals according to purposes/use.
0137.2.3 Identify breeds of large animals (horses, cattle, sheep, goats, swine).
0137.2.4 Relate the characteristics of breeds to methods of selection.

Standard 3: Handling and Restraint (0137.S.3)
Students will demonstrate safe methods for handling and restraining farm animals.

Handling and Restraint Objectives
Students will:
0137.3.1 Identify and use tools related to handling and restraint of large animals.
0137.3.2 Demonstrate methods of techniques used in restraint of large animals.
0137.3.3 Utilize basic commands and animal behavior methods to control animals.
0137.3.4 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0137.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0137.4.1 Utilize safety practices in grooming and clipping large animals.
0137.4.2 Identify and utilize tools pertinent to the grooming, brushing and bathing of large animals.
0137.4.3 Demonstrate the ability to follow post-operative care and management of animals.

Standard 5: Anatomy and Physiology (0137.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:

0137.5.1 Identify the major parts and examine the functions of the skeletal system.
0137.5.2 Identify the major parts and examine the functions of the muscular system.
0137.5.3 Identify the major parts and examine the functions of the nervous system.
0137.5.4 Identify the major parts and examine the functions of the endocrine system.
0137.5.5 Identify the major parts and examine the functions of the respiratory system.
0137.5.6 Identify the major parts and examine the functions of the circulatory system.
0137.5.7 Identify the major parts and examine the functions of the reproductive system.
0137.5.8 Identify the major parts and examine the functions of the excretory system.
0137.5.9 Identify the major parts and examine the functions of the digestive system.
0137.5.10 Compare and contrast ruminant and monogastric systems.
0137.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0137.S.6)
Students will display a working knowledge of managing animal health.

Animal Health and Management Objectives
Students will:

0137.6.1 Determine the type of care and housing facilities needed for large animals.
0137.6.2 Examine mechanical injury and perform basic first aid requirements for large farm animals.
0137.6.3 Identify signs/symptoms of disease, as well as prevention and treatment of large animals.
0137.6.4 Utilize techniques in administering medicine and immunizing large farm animals.
0137.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies used with a large farm animal.
0137.6.6 Recognize relationships between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0137.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0137.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0137.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0137.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0137.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0137.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis of large animals.
0137.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic and field operations.
0137.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0137.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:

0137.8.1 Define, discuss and utilize terms associated with large animal nutrition.
0137.8.2 List and describe the basic nutrients and their functions.

0137.8.3 Analyze feed labels and determine the nutritional value of feeds and feedstuffs.
0137.8.4 Recognize signs of nutritional deficiencies.
0137.8.5 Analyze feeding and care requirements for maintaining pregnancy of large animals.

Standard 9: Marketing
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0137.9.1 Record data and complete information required by law and regulations in the management of large animals.
0137.9.2 Calculate and analyze cost of owning and operating a large animal health clinic.

Standard 10: Technology Applications (0137.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0137.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0137.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0137.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0137.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0137.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0137.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0137.11.2 Explore careers available in animal science.
0137.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0137.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0137.11.5 Demonstrate correct language usage in all oral and written work.
0137.11.6 Perform effectively in both leadership and non-leadership roles.
0137.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0137.11.8 Participate as a team member to complete a variety of assignments.

Animal And Veterinary Science – Small Animals

This agricultural science course is designed to give students a working knowledge of veterinary science through the study of many animals including dogs, cats, birds, reptiles and other pets. This course will provide an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of animals along with their management in health care related to technician and veterinarian skills.

Standard 1: Leadership (0138.S.1)
Students will become involved in activities to develop leadership in animal and veterinary science.

Leadership Objectives
Students will:
0138.1.1 Demonstrate an awareness of FFA and its components.
0138.1.2 Utilize record-keeping skills in work-based experience programs.
0138.1.3 Research appropriate career opportunities in veterinary medicine.
0138.1.4 Draft a resume, fill out a job application, demonstrate job seek/keep and computer skills.
0138.1.5 Develop and exhibit personal relation and communication skills.
0138.1.6 Demonstrate an awareness of employment and animal welfare ethics.

Standard 2: History and Selection of Small Animals (0138.S.2)
Students will examine the history and selection of small animals.

History and Selection of Small Animals Objectives
Students will:
0138.2.1 Trace the history of domestic animals and relate it to human and animal health.
0138.2.2 Classify small animals according to purposes/use.
0138.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0138.2.4 Examine the characteristics of small animals and incorporate into laboratory experimentation and disease evaluation.

Standard 3: Handling and Restraint (0138.S.3)
Students will demonstrate safe methods for handling and restraining small animals.

Handling and Restraint Objectives
Students will:
0138.3.1 Identify and use tools related to handling and restraint of small animals.
0138.3.2 Demonstrate methods and techniques used in restraint of small animals.
0138.3.3 Develop a basic understanding of animal behavior.
0138.3.4 Demonstrate the ability to follow post-operative care and management of animals.
0138.3.5 Utilize safety practices when handling and caring for animals.

Standard 4: Grooming and Clipping (0138.S.4)
Students will demonstrate safe grooming and clipping procedures.

Grooming and Clipping Objectives
Students will:
0138.4.1 Utilize safety practices in grooming and clipping small animals.
0138.4.2 Identify and use animal grooming tools.
0138.4.3 Demonstrate an awareness of grooming practices (bathing, clipping, nail trimming, combing/brushing).
0138.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0138.S.5)
Students will describe anatomy and physiology.

Anatomy and Physiology Objectives
Students will:
0138.5.1 Identify the major parts and examine the functions of the skeletal system.
0138.5.2 Identify the major parts and examine the functions of the muscular system.
0138.5.3 Identify the major parts and examine the functions of the nervous system.
0138.5.4 Identify the major parts and examine the functions of the endocrine system.
0138.5.5 Identify the major parts and examine the functions of the respiratory system.
0138.5.6 Identify the major parts and examine the functions of the circulatory system.
0138.5.7 Identify the major parts and examine the functions of the reproductive system.
0138.5.8 Identify the major parts and examine the functions of the excretory system.
0138.5.9 Identify the major parts and examine the functions of the digestive system.
0138.5.10 Compare and contrast ruminant and monogastric systems.
0138.5.11 Investigate the functions of other small animal digestive systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0138.S.6)
Students will describe the principles of managing animal health.

Animal Health and Management Objectives
Students will:
0138.6.1 Determine the type of care and housing facilities needed.
0138.6.2 Examine mechanical injury and perform basic first aid.
0138.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0138.6.4 Utilize techniques in administering medicine and immunizing.
0138.6.5 Understand veterinarian hospital design, procedures and care of equipment and supplies.
0138.6.6 Recognize relationship between owner, animal and veterinarian to maintain a healthy client relationship.

Standard 7: Laboratory Investigation (0138.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0138.7.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0138.7.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0138.7.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0138.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.
0138.7.5 Recognize the value of laboratory procedures in evaluating the functions of organs to assist in disease diagnosis.
0138.7.6 Utilize and care for diagnostic testing equipment and supplies used in a veterinarian clinic.
0138.7.7 Collect laboratory samples and interpret test results to diagnose animal health.

Standard 8: Nutrition (0138.S.8)
Students will describe animal nutrition.

Nutrition Objectives
Students will:
0138.8.1 Define, discuss and utilize terms associated with nutrition.

0138.8.2 List and describe the basic nutrients and their functions.
0138.8.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0138.8.4 Recognize signs of nutritional deficiencies.
0138.8.5 Analyze feeding and care requirements throughout life cycle and pregnancy.

Standard 9: Marketing (0138.S.9)
Student will research regulations impacting animal care business.

Marketing Objectives
Students will:
0138.9.1 Research types of laws, regulations and licenses as needed in a veterinarian clinic.
0138.9.2 Calculate and analyze costs of owning and operating an animal care business.

Standard 10: Technology Applications (0138.S.10)
Student will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0138.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science.
- Locate, evaluate, and collect information from a variety of sources related to animal science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0138.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.
0138.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to animal science.
0138.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science.

Standard 11: Process/Workplace Skills and Animal Science (0138.S.11)
Student will demonstrate personal and group workplace skills.

Process/Workplace Skills and Animal Science Objectives
Students will:
0138.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0138.11.2 Explore careers available in animal science.
0138.11.3 Use a variety of sources to investigate the educational requirements of various careers in animal science and related sciences.
0138.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0138.11.5 Demonstrate correct language usage in all oral and written work.
0138.11.6 Perform effectively in both leadership and non-leadership roles.
0138.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0138.11.8 Participate as a team member to complete a variety of assignments.

Animal Processing

This course is designed to provide students with basic knowledge and skills in meat processing occupations. Students will be able to exhibit these skills in the areas of sanitation and safety, slaughtering, processing and retailing, job seek/keep skills and microcomputer applications.

Standard 1: Leadership (0139.S.1)
Students will:

- demonstrate skills necessary to be employed.

Leadership Objectives
Students will:

0139.1.1 Participate in FFA activities.
0139.1.2 Write, deliver and evaluate a speech and/or oral presentation.
0139.1.3 Explore careers in processing.
0139.1.4 Determine appropriate job seek/keep skills.
0139.1.5 Demonstrate knowledge of ethical conduct in the workplace.

Standard 2: Sanitation/Safety (0139.S.2)
Students will:

- safely handle meat products.

Sanitation/Safety Objectives
Students will:

0139.2.1 List USDA sanitary practices relating to personal hygiene, sanitization of equipment and maintenance of facilities.
0139.2.2 Explain safe methods of handling tools, equipment and livestock in processing and slaughtering.
0139.2.3 Identify proper temperatures and time periods for storage and handling of fresh and frozen meat and meat products.
0139.2.4 Identify proper storage and handling techniques for consumables and by-products.

Standard 3: Slaughtering (0139.S.3)
Students will:

- demonstrate slaughtering procedures.

Slaughtering Objectives
Students will:

0139.3.1 List common breeds, USDA classes and grades of live cattle, sheep and swine.
0139.3.2 Demonstrate how to yield and quality grade hanging carcasses.
0139.3.3 Describe humane processes for stunning and bleeding animals.
0139.3.4 Properly skin, eviscerate and split carcasses of cattle.
0139.3.5 Skin or scald and scrape, eviscerate and split pork carcasses.
0139.3.6 Skin, fist and eviscerate lamb and mutton carcasses.
0139.3.7 Compute dressing percentage, percent shrink, return on offal and slaughter cost.
0139.3.8 Properly weigh and mark carcasses.

Standard 4: Processing (0139.S.4)
Students will:

- prepare retail meat products.

Processing Objectives
Students will:

0139.4.1 Identify primal cuts of beef, pork and lamb.
0139.4.2 Break carcasses into primal cuts.
0139.4.3 Identify retail cuts of beef, pork and lamb.
0139.4.4 Identify common boneless cuts of boxed beef and pork.
0139.4.5 Cut primal cuts and boxed products into various retail cuts.
0139.4.6 List methods of value added processing (grinding, curing, smoking, pre-cooking) and packaging of beef pork and lamb

Standard 5: Retailing (0139.S.5)
Students will:

- utilize merchandise product for customers.

Retailing Objectives
Students will:
0139.5.1 Prepare attractive displays of meat and meat products.
0139.5.2 Demonstrate knowledge and skills in customer relations.
0139.5.3 Exhibit an understanding of retail value; trim loss, shelf life and seasonal demand as related to pricing of products.

Standard 6: Technology Applications (0139.S.6)
Students will:

- apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0139.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal processing.
- Locate, evaluate, and collect information from a variety of sources related to animal processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0139.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0139.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal processing.
0139.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal processing.

Standard 7: Process/Workplace Skills (0139.S.7)
Students will:

- demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0139.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0139.7.2 Explore careers available in animal processing.
0139.7.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0139.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0139.7.5 Demonstrate correct language usage in all oral and written work.
0139.7.6 Perform effectively in both leadership and non-leadership roles.

0139.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0139.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0139.S.8)
Students will:

- safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0139.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0139.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0139.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0139.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Animal Science And Production

This agriculture science course is designed to give students a working knowledge of the commercial livestock industry, which includes beef, sheep, swine, horses, goats, dairy and poultry. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection, and economic and marketing principles related to employment. Students will develop a working knowledge of land use and livestock production to maintain an economical level of production. Upon completion of this course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0140.S.1)
Students will develop leadership skills.

Leadership Objectives
Students will:
0140.1.1 Describe FFA and its components.
0140.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0140.1.3 Identify careers in the animal industry.
0140.1.4 Identify employability skills.
0140.1.5 Develop personal relation and communication skills.
0140.1.6 Describe employment and animal welfare ethics.

Standard 2: History and Selection of Animals (0140.S.2)
Students will provide background information and describe characteristics of animals.

History and Selection of Animals Objectives
Students will:
0140.2.1 Relate the history of domestic animals to modern animal production.
0140.2.2 Describe and classify small animals according to purpose/use.
0140.2.3 Identify breeds of animals.
0140.2.4 Relate the characteristics of breeds to methods of selection (beef, sheep, swine, horses, goats, dairy and poultry).

Standard 3: Handling and Restraint (0140.S.3)
Students will demonstrate safe handling and restraining techniques.

Handling and Restraint Objectives
Students will:
0140.3.1 Identify and use tools related to handling/restraint of animals.
0140.3.2 Identify methods and techniques used in modern husbandry practices.
0140.3.3 Describe techniques in grooming and showing livestock.
0140.3.4 Describe safety practices for managing and handling livestock.

Standard 4: Animal Health and Management (0140.S.4)
Students will demonstrate animal health and management skills.

Animal Health and Management Objectives
Students will:
0140.4.1 Determine the type of care and housing facilities needed for livestock.
0140.4.2 Describe mechanical injury and treatment requirements.
0140.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0140.4.4 Utilize techniques in administering medicine and immunizing.
0140.4.5 Design and utilize a herd health program in livestock production.

Standard 5: Anatomy and Physiology (0140.S.5)
Students will utilize the fundamentals of anatomy and physiology in the commercial production of livestock.

Anatomy and Physiology Objectives
Students will:

0140.5.1 Identify the major parts and functions of the anatomy of various types of livestock.
0140.5.2 Identify the major parts and functions of the digestive system.
0140.5.3 Identify the major parts and functions of the reproductive system.
0140.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to livestock management.
0140.5.5 Identify and explain modern livestock breeding techniques.
0140.5.6 Analyze and explain data utilizing genotypic information to form a superior livestock program.

Standard 6: Nutrition (0140.S.6)
Students will describe the role of nutrition in animal production.

Nutrition Objectives
Students will:

0140.6.1 Define terms associated with nutrition.
0140.6.2 List and describe the basic nutrients and their functions.
0140.6.3 Balance rations and determine the nutritional value of feeds and feedstuffs.
0140.6.4 Identify signs of nutritional deficiencies.
0140.6.5 Identify feeding and care requirements throughout life cycle and pregnancy of livestock.
0140.6.6 Identify and design various forage management programs for economical livestock production

Standard 7: Marketing (0140.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:

0140.7.1 Research and study various livestock marketing techniques.
0140.7.2 Identify transportation and safety methods for livestock handling.
0140.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0140.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Technology Applications (0140.S.8)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0140.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in animal science and production.
- Locate, evaluate, and collect information from a variety of sources related to animal science and production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0140.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0140.8.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to animal science and production.
0140.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of animal science and production.

Standard 9: Process/Workplace Skills (0140.S.9)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0140.9.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0140.9.2 Explore careers available in animal science.
0140.9.3 Use a variety of sources to investigate the educational requirements of various careers in animal and science production.
0140.9.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0140.9.5 Demonstrate correct language usage in all oral and written work.
0140.9.6 Perform effectively in both leadership and non-leadership roles.
0140.9.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0140.9.8 Participate as a team member to complete a variety of assignments.

Standard 10: Laboratory Investigation (0140.10)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0140.10.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0140.10.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0140.10.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0140.10.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Aquaculture

This course of study is designed to provide experiential knowledge, skills and entrepreneurial competencies needed to enter various occupations in aquaculture and other scientific fields within aquaculture. This course integrates curricula of biology, physics, earth science and chemistry in producing aquatic species.

Standard 1: Orientation to the Aquaculture Industry (0141.S.1)
Students will examine the role of aquaculture in state, national and international economies.

Aquaculture Industry Objectives
Students will:
0141.1.1 Explore the role of aquaculture in the past, present and future.
0141.1.2 Relate the importance of aquaculture to state, national, and international economies.
0141.1.3 Examine employment trends and cycles related to aquaculture.

Standard 2: Leadership Development in Aquaculture (0141.S.2)
Students will participate in activities to develop leadership in the aquaculture industry.

Leadership Development in Aquaculture Objectives
Students will:
0141.2.1 Present prepared and extemporaneous speeches on issues concerning the aquaculture industry.
0141.2.2 Participate in community service.
0141.2.3 Demonstrate problem solving and decision making skills.
0141.2.4 Conduct meetings using parliamentary law.

Standard 3: Production Systems in Aquaculture (0141.S.3)
Students will design, establish and maintain aquaculture systems.

Production Systems in Aquaculture Objectives
Students will:
0141.3.1 Identify components of an aquaculture system and calculate water volumes, flow rates, solubility, density, etc.
0141.3.2 Research appropriate species for closed and flow-through systems.
0141.3.3 Explain basic animal management requirements for warm and cold-water species.
0141.3.4 Investigate and discuss factors that influence site selection.
0141.3.5 Using a bill of materials, design and/or construct a closed system.

Standard 4: Developing Work-based Experiential Programs (Supervised Agricultural Experience Programs) in Aquaculture (0141.S.4)
Students will explore entrepreneurial and employment opportunities in aquaculture.

Aquaculture Objectives
Students will:
0141.4.1 Define and explain the different supervised experience programs that are available in aquaculture.
0141.4.2 Prepare a business plan for implementation.
0141.4.3 Explore careers associated within the aquaculture industry.
0141.4.4 Create and demonstrate the key aspects of a marketing plan.
0141.4.5 Demonstrate different ways a fish can be processed.

Standard 5: Anatomy and Physiology (0141.S.5)
Students will identify and explain functions and disorders of body systems in aquatic species.

Anatomy and Physiology Objectives
Students will:
0141.5.1 Identify and explain the functions of body systems in aquatic species.
0141.5.2 Explain the process of spawning.
0141.5.3 Distinguish common fish health problems in closed systems.
0141.5.4 Investigate the role of breeding and selection in genetic improvement.

Standard 6: Nutrition (0141.S.6)
Students will describe nutrition affecting aquatic species.

Nutrition Objectives
Students will:
0141.6.1 Identify and compare common types of feed.
0141.6.2 Calculate feed rates.
0141.6.3 Calculate feed conversion.
0141.6.4 Calculate feed efficiency.
0141.6.5 Describe the nutritional needs of fish at different stages of growth.

Standard 7: Water Chemistry and its Relationship to Aquaculture (0141.S.7)
Students will perform water quality procedures and rebate results to performance of aquatic species.

Water Chemistry Objectives
Students will:
0141.7.1 Explain water quality parameters.- pH, Oxygen level, nitrates, nitrates, etc.
0141.7.2 Demonstrate sampling and testing techniques.
0141.7.3 Design a wastewater management system.

Standard 8: Safety in Aquaculture Laboratories (0141.S.8)
Students will demonstrate principles of safety in aquaculture.

Aquaculture Laboratories Objectives
Students will:
0141.8.1 Maintain a safe working environment in the aquaculture laboratory.
0141.8.2 Demonstrate and apply laboratory safety in aquaculture settings.

Standard 9: Laboratory Practices and Procedures/Hands-on Learning (0141.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Practices and Procedures Objectives
Students will:
0141.9.1 Engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills.
0141.9.2 Properly and safely manipulate equipment, materials, chemicals, organisms and models.
0141.9.3 Conduct explorations in a variety of environments (e.g., laboratories and outdoor locations).
0141.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research.

Standard 10: Technology Applications in Aquaculture (0141.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications in Aquaculture Objectives
Students will:

0141.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in aquaculture.
- Locate, evaluate, and collect information from a variety of sources related to aquaculture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0141.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics, and telecommunications.

0141.10.3 Use TV/satellite, VCR and Laserdiscs/DVD to retrieve information to complete assignments related to aquaculture.

0141.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of aquaculture.

Standard 10: Process/workplace Skills and Aquaculture (0141.S.10)
Students will demonstrate personal and group workplace skills.

Workplace Skills Objectives
Students will:

0141.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0141.11.2 Explore careers available in aquaculture.

0141.11.3 Use a variety of sources to investigate the educational requirements of various careers in aquaculture and related sciences.

0141.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0141.11.5 Demonstrate correct language usage in all oral and written work.

0141.11.6 Perform effectively in both leadership and non-leadership roles.

0141.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0141.11.8 Participate as a team member to complete a variety of assignments.

Computers In Agriculture

This course is designed to expose students to computer programming, software and applications and graphical and electronic information technology as it relates to the agriculture industry. Students will be able to utilize computers and related technology in desktop publishing, record-keeping, agricultural production, agribusiness and telecommunications. Students will also relate these applications to potential occupations within the computer technology field.

Standard 1: Word Processing and Communications (0142.S.1)
Students will demonstrate skills involving word processing in agriculture.

Word Processing and Communications Objectives
Students will:
0142.1.1 Prepare documents using word processing software.
0142.1.2 Utilize keyboarding skills for preparing reports and letters.
0142.1.3 Improve writing skills through the use of grammatical aids.
0142.1.4 Utilize data management systems.

Standard 2: Spreadsheet Applications (0142.S.2)
Students will use agricultural data in computer-based spreadsheets.

Spreadsheet Applications Objectives
Students will:
0142.2.1 Use software programs to integrate mathematical functions into agricultural production and agribusiness systems.
0142.2.2 Manipulate numerical data as it relates to cost benefit analysis.
0142.2.3 Prepare budgets, financial statements, income reports and production records.
0142.2.4 Complete applications relating to work-based experiences (Supervised Agricultural Experience Programs).

Standard 3: Graphical Presentations (0142.S.3)
Students will utilize graphical presentation software.

Graphical Presentations Objectives
Students will:
0142.3.1 Utilize graphic based software for presentations.
0142.3.2 Prepare visual aids for communicative demonstrations.

Standard 4: Electronic Information Systems (0142.S.4)
Students will demonstrate skills involving electronic information systems.

Electronic Information Systems Objectives
Students will:
0142.4.1 Utilize telecommunications resources in writing documents, manipulating data and transmitting information.
0142.4.2 Retrieve data from agricultural networks.
0142.4.3 Investigate product-marketing principles using computer technology.
0142.4.4 Integrate computer technology into agricultural production systems through the use of remote control and remote sensor science.
0142.4.5 Explore Global Positioning Satellite applications in agriculture.

Standard 5: Agricultural Journalism and Desktop Publishing (0142.S.5)
Students will produce agricultural publications.

Agricultural Journalism and Desktop Publishing Objectives
Students will:

0142.5.1 Prepare newspaper and magazine articles for publishing.
0142.5.2 Manufacture flyers, programs and booklets using graphic software.
0142.5.3 Design a template for printing books, articles and programs.

Standard 6: Process/Workplace Skills (0142.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0142.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0142.6.2 Explore careers available in computer technology.
0142.6.3 Use a variety of sources to investigate the educational requirements of various careers in computer technology.
0142.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0142.6.5 Demonstrate correct language usage in all oral and written work.
0142.6.7 Perform effectively in both leadership and non-leadership roles.
0142.6.8 Evaluate information for reliability, completeness, and applicability to various assignments.
0142.6.9 Participate as a team member to complete a variety of assignments.

Environmental Technology

This class will cover various aspects of environmental science applications to prevent detrimental effects on our ecosystem. Units will include solid and hazardous waste, water purification, wastewater treatment, solid erosion control, nutrient management and environmental surveying.

Standard 1: Solid Waste (0143.S.1)
Students will identify solid waste.

Solid Waste Objectives
Students will:
0143.1.1 Analyze sources of solid waste.
0143.1.2 Examine hazards in solid waste materials and disposal.
0143.1.3 Compare and contrast methods of solid waste disposal.
0143.1.4 Explain and participate in recycling.
0143.1.5 Describe composting.
0143.1.6 Explore methods and benefits of composting.

Standard 2: Hazardous Waste (0143.S.2)
Students will identify hazardous waste materials.

Hazardous Waste Objectives
Students will:
0143.2.1 Identify types of hazardous waste.
0143.2.2 Describe ecotoxicology.
0143.2.3 Explain hazardous waste disposal.
0143.2.4 Explain safety procedures and simulate clean up of spills.

Standard 3: Water Purification (0143.S.3)
Students will identify water purification.

Water Purification Objectives
Students will:
0143.3.1 Describe the composition of water.
0143.3.2 Explain the importance of water.
0143.3.3 Identify sources of water.
0143.3.4 Investigate and discuss how water is stored and distributed.
0143.3.5 Research how water is used and managed.
0143.3.6 Name and distinguish various types of wetlands.
0143.3.7 Explore the benefits and function of wetlands.
0143.3.8 Analyze how human action affects wetlands.

Standard 4: Wastewater Treatment and Disposal (0143.S.4)
Students will identify wastewater treatments and disposals.

Wastewater Treatment and Disposal Objectives
Students will:
0143.4.1 Identify sources of wastewater.
0143.4.2 Describe hazards in wastewater.
0143.4.3 Compare and contrast ways of treating wastewater.
0143.4.4 Research the products of wastewater treatment, including the production and use of biosolids.
0143.4.5 Recognize and investigate the important biological, chemical, and biogeochemical processes in wastewater treatment.

0143.4.6 Explain the components and operation of a wastewater treatment system.

Standard 5: Soil Erosion Control (0143.S.5)
Students will identify soil erosion.

Soil Erosion Control Objectives
Students will:
0143.5.1 Identify and describe the physical properties of soil and their impact on soil erosion.
0143.5.2 Compare and contrast types of soil erosion.
0143.5.3 Illustrate soil conservation practices for urban and agricultural areas.
0143.5.4 Utilize a soil survey to make environmental decisions.
0143.5.5 Explain the best management practices to control sediment from urban areas, agriculture and forests.
0143.5.6 Examine soil erosion control devices.

Standard 6: Nutrition Management (0143.S.6)
Students will identify nutritional management of soil.

Nutrition Management Objectives
Students will:
0143.6.1 Investigate and discuss non-point source pollution.
0143.6.2 Utilize soil nutrient testing procedures to determine available nutrients.
0143.6.3 Utilize nutrient testing procedures to determine organic matter content.
0143.6.4 Complete a nutrient management plan.
0143.6.5 Calibrate a nutrient spreader for rate of application.
0143.6.6 Perform water-testing procedures and interpret results to determine impacts of non-point source pollution.

Standard 7: Environmental Surveying (0143.S.7)
Students will identify the trade of environmental surveying.

Environmental Surveying Objectives
Students will:
0143.7.1 Demonstrate basic surveying skills.
0143.7.2 Utilize topographical maps to make environmental decisions.
0143.7.3 Apply design principles to pond and wetland construction, sediment basins, and other similar structures.
0143.7.4 Identify and accurately utilize surveying equipment.

Standard 8: Leadership (0143.S.8)
Students will participate in related activities.

Leadership Objectives
Students will:
0143.8.1 Participate in WV Envirothon and other activities related to the curriculum.
0143.8.2 Utilize Internet World Wide Net to explore specialty areas in horticulture.

Standard 9: Laboratory Investigation (0143.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0143.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0143.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0143.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0143.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0143.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0143.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in environmental technology.
- Locate, evaluate, and collect information from a variety of sources related to environmental technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0143.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0143.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to environmental technology.
0143.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of environmental technology.

Standard 11: Process/Workplace Skills (0143.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0143.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0143.11.2 Explore careers available in environmental technology.
0143.11.3 Use a variety of sources to investigate the educational requirements of various careers in environmental technology.
0143.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0143.11.5 Demonstrate correct language usage in all oral and written work.
0143.11.6 Perform effectively in both leadership and non-leadership roles.
0143.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0143.11.8 Participate as a team member to complete a variety of assignments.

Food Science and Processing

This course is designed to provide students with knowledge, skills and competencies needed to enter various food science and food products processing careers. Major concepts covered are leadership, nutrition, food safety, and food products processing and marketing of food products.

Standard 1: Leadership (0144.S.1)
Students will demonstrate leadership skills.

Leadership Objectives
Students will:
0144.1.1 List food science and food products processing related careers.
0144.1.2 Participate in FFA activities.
0144.1.3 Complete a Supervised Agricultural Experience (SAE) Program.
0144.1.4 Present individual and group presentations on food products processing related topics.
0144.1.5 Conduct meetings using parliamentary law.

Standard 2: Nutrition (0144.S.2)
Students will explain basics of good nutrition and good health.

Nutrition Objectives
Students will:
0144.2.1 Identify six basic nutrients and related nutrient deficiencies.
0144.2.2 Read and interpret information on product labels.
0144.2.3 Demonstrate knowledge of food groups by classifying foods accordingly.
0144.2.4 Explain procedures involved in enhancing the nutritional value of food.
0144.2.5 Relate retail cost and nutritional value of food palatability.
0144.2.6 Demonstrate an awareness of the effects of food on physical health and well being.

Standard 3: Food Safety (0144.S.3)
Students will describe factors affecting food safety.

Food Safety Objectives
Students will:
0144.3.1 Identify common risks and safety hazards involved in storage, handling, processing and preparation of food products.
0144.3.2 Understand the influence of potable water on processing, storing and packaging food.
0144.3.3 Describe the effects of microbes on food spoilage during processing, handling, storage and food preparation.
0144.3.4 Describe FSIS and USDA inspection and grading standards relating to food products.
0144.3.5 Relate the importance of product testing to providing a safe and wholesome food supply (including drugs/hormones, pesticides and consumer quality issues.)

Standard 4: Food Products Processing (0144.S.4)
Students will explore different techniques of processing foods.

Food Products Processing Objectives
Students will:
0144.4.1 Analyze the effects of food processing techniques on the nutritional value of foods.
0144.4.2 Demonstrate food-processing techniques used in the dairy products industry. (fermentation, pasteurization and homogenization).
0144.4.3 Describe techniques used in cereal grain processing. (bleaching, grinding, milling and enriching).

0144.4.4 List processing techniques used in the meat industry. (cooking, curing, grinding).
0144.4.5 Demonstrate an awareness of food processing techniques used in the fruit and vegetable industry (canning, freezing, heating.)
0144.4.6 Dehydrate food items to produce less perishable products.
0144.4.7 Describe and demonstrate food preservation techniques.
0144.4.8 Identify bioengineered food items and describe microbiological processing techniques.

Standard 5: Marketing (0144.S.5)
Students will explore factors that influence food cost and consumption trends.

Marketing Objectives
Students will:
0144.5.1 Describe the relative cost of food in the U.S. as compared to other counties.
0144.5.2 Identify trends and cycles in food product markets.
0144.5.3 Relate pricing of products to trends and cycles in markets.
0144.5.4 Demonstrate an awareness of different packaging techniques and their effects on product quality.
0144.5.5 List transportation methods used in marketing products.

Standard 6: Technology Applications (0144.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0144.6.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in food science and processing.
- Locate, evaluate, and collect information from a variety of sources related to food science and processing.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0144.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0144.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to food science and processing.
0144.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of food science and processing.

Standard 7: Process/Workplace Skills (0144.S.7)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0144.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0144.7.2 Explore careers available in food science and processing.
0144.7.3 Use a variety of sources to investigate the educational requirements of various careers in food science.
0144.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0144.7.5 Demonstrate correct language usage in all oral and written work.
0144.7.6 Perform effectively in both leadership and non-leadership roles.
0144.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0144.7.8 Participate as a team member to complete a variety of assignments.

Standard 8: Laboratory Investigation (0144.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:

0144.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0144.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0144.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0144.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Hydroponics

This course emphasizes the scientific method in the production of hydroponic plants. The curriculum provides problem solving experiences and skills in plant propagation, plant growth and development in a soilless media.

Standard 1: Orientation to Hydroponics and Industry (0145.S.1)
Students will explore hydroponics technique and identify the progress in the industry.

Hydroponics and Industry Objectives
Students will:
0145.1.1 Describe the history and development of hydroponic growing techniques.
0145.1.2 Identify advantages and constraints of hydroponics.
0145.1.3 Compare and contrast traditional growing methods to soilless culture.

Standard 2: Classification of Hydroponic Plant Production System (0145.S.2)
Students will recognize the diversity of hydroponic systems and media.

Classification Objectives
Students will:
0145.2.1 Describe the difference between open and closed plant production system.
0145.2.2 Identify types and characteristics of soilless media.
0145.2.3 Describe solution, culture methods and nutrient film technique.

Standard 3: Plant Growth and Development (0145.S.3)
Students will describe plant structures and environmental requirements for plant growth.

Plant Growth and Development Objectives
Students will:
0145.3.1 Identify plant structures and functions.
0145.3.2 Describe environmental requirements for plant growth.

Standard 4: Leadership and Interpersonal Skill Development (0145.S.4)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0145.4.1 Serve as a small group team leader.
0145.4.2 Identify leadership and decision making skills.
0145.4.3 Participate in committee and leadership development activities.
0145.4.4 Conduct community and school improvement projects.

Standard 5: Developing Work-Based Experiential Programs (0145.S.5)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0145.5.1 Determine areas and careers of major interest in agriculture.
0145.5.2 Manage school-based hydroponics laboratory enterprises.
0145.5.3 Establish experience program record book procedures.

Standard 6: Laboratory Safety Skills (0145.S.6)
Students will practice and demonstrate safety in the laboratory.

Safety Skills Objectives
Students will:
0145.6.1 Establish a safe working environment.
0145.6.2 Identify safety polices and procedures.
0145.6.3 Demonstrate proper use of equipment.

Standard 7: Computer Applications in Hydroponics and Plant Science (0145.S.7)
Students will apply technology to investigate real-world problems.

Computer Applications Objectives
Students will:
0145.7.1 Use Internet for research applications in hydroponics.
0145.7.2 Identify how computer based systems may be used for hydroponics environmental control.
0145.7.3 Utilize keyboarding and word processing skills to prepare class reports.

Standard 8: Greenhouse Structures (0145.S.8)
Students will recognize environmental components for structure construction and operation.

Greenhouse Structures Objectives
Students will:
0145.8.1 Identify environmental controls (heating and cooling components) of a greenhouse.
0145.8.2 Explain the function of greenhouse structure components.
0145.8.3 Determine the appropriate site and location of a hydroponics greenhouse.

Standard 9: Producing Hydroponic Crops (0145.S.9)
Students will determine appropriate amendments and identify effective procedures for hydroponic crop management.

Hydroponic Crops Objectives
Students will:
0145.9.1 List requirements of hydroponic tomatoes and lettuce production systems.
0145.9.2 Identify other plants that may be produced hydroponically.
0145.9.3 Test, interpret and manage pH.
0145.9.4 Measure electrical conduction of nutrient solution.
0145.9.5 Mix and manage hydroponic solutions.
0145.9.6 Determine methods of biological insect control.
0145.9.7 Identify mineral deficiencies.

Leadership Development

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships.

Standard 1: Leadership Styles (0146.S.1)
Students will describe various leadership styles.

Leadership Styles Objectives
Students will:
0146.1.1 Define leadership.
0146.1.2 Explain traits and styles.
0146.1.3 Explore different personality traits.
0146.1.4 Recognize informal leader.

Standard 2: Developing Formal Leadership Methods (0146.S.2)
Students will explain leadership methods.

Formal Leadership Objectives
Students will:
0146.2.1 Describe duties of officers in an organization.
0146.2.2 Define all different forms of motions.
0146.2.3 Identify proper conduct for meetings.

Standard 3: Public Speaking (0146.S.3)
Students will acquire skills in public speaking.

Public Speaking Objectives
Students will:
0146.3.1 Present two required speeches.
0146.3.2 Prepare an introduction for invited guest speakers.
0146.3.3 Observe invited quest speakers for different speaking styles.
0146.3.4 Become involved in a controlled debate.
0146.3.5 Conduct small group discussions on current events.

Standard 4: Community Service (0146.S.4)
Students will develop skills to participate in community service.

Community Service Objectives
Students will:
0146.4.1 Conduct community projects. Depending on the community the class can do many different projects with the Chamber of Commerce, Rotary, United Way, etc.
0146.4.2 Conduct school improvement projects. Work with the student council in developing projects that will improve the school grounds, buildings, etc.
0146.4.3 Conduct projects that deal with drug awareness, drinking and driving, etc.

Standard 5: Goal Setting (0146.S.5)
Students will use goal setting, time management and stress management.

Goal Setting Objectives
Students will:
0146.5.1 Explore goal setting (long term and short term).

0146.5.2 Describe methods of time management.
0146.5.3 Identify stress reduction methods.

Standard 6: Job Seeking Skills (0146.S.6)
Students will develop job-seeking skills.

Job Seeking Skills Objectives
Students will:
0146.6.1 Explore areas of proper dress in the work place.
0146.6.2 Prepare a cover letter and resume.
0146.6.3 Describe proper interview techniques for an oral interview.

Standard 7: Interpersonal Relations (0146.S.7)
Students will demonstrate interpersonal relationships for job success.

Interpersonal Relations Objectives
Students will:
0146.7.1 Explain and discuss a paradigm shift.
0146.7.2 Write thank you letters to the teachers before graduation.
0146.7.3 Explore conflict resolution.
0146.7.4 Hold mock social gathering with adults.
0146.7.5 Explore proper ethics and values.

Standard 8: Technology Application (0146.S.8)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0146.8.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in leadership development.
- Locate, evaluate, and collect information from a variety of sources related to leadership development.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0146.8.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0146.8.3 Use TV/Satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to leadership development.
0146.8.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of leadership development.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Leadership Development (0147.S.1)
Students will participate in activities to promote leadership development.

Leadership Development Objectives
Students will:
0147.1.1 Identify the year FFA was formed.
0147.1.2 Name the author of the creed.
0147.1.3 Identify the location of the state and national convention.
0147.1.4 Name the state and national FFA advisors.
0147.1.5 Name the degree levels in FFA.
0147.1.6 Identify parts of the emblem.
0147.1.7 Present a speech on outdoor recreation.

Standard 2: Career Development (0147.S.2)
Students will research career development in outdoor recreation.

Career Development Objectives
Students will:
0147.2.1 Identify regional career opportunities in outdoor recreation including. Park Ranger, Recreation Manager, Instructor, Conservation Officer, First Aid/Safety Expert, Entertainment Manager, Business Manager, Outdoor Guide, Youth Camp Operator, Campground Owner, Riding Stable Owner and Lifeguard.
0147.2.2 Profile outdoor recreation specialists.
0147.2.3 Develop teamwork skills and activities.
0147.2.4 Develop public relation skills.

Standard 3: Outdoor Safety (0147.S.3)
Students will participate in activities to promote outdoor safety.

Outdoor Safety Objectives
Students will:
0147.3.1 Obtain Red Cross first aid certificate.
0147.3.2 Obtain Red Cross adult CPR certificate.
0147.3.3 Identify potential outdoor safety hazards.
0147.3.4 Identify poisonous plants.
0147.3.5 Identify poisonous insects.
0147.3.6 Identify poisonous animals.
0147.3.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 4: Natural Resource and Recreation (0147.S.4)
Students will identify natural resource and recreation areas.

Natural Resource and Recreation Objectives
Students will:
0147.4.1 Describe geological formations.
0147.4.2 Recognize services required for recreational areas.
0147.4.3 Recognize facilities required for recreational areas.

0147.4.4 Identify endangered species of plants and animals.
0147.4.5 Identify wetlands and riparian zones.
0147.4.6 Describe local, state and federal laws related to recreational enterprises.

Standard 5: Business Opportunities and Promotions (0147.S.5)
Students will recognize business opportunities and promotions.

Business Opportunities and Promotions Objectives
Students will:
0147.5.1 Recognize income potential from various types of recreational enterprises.
0147.5.2 Identify business procedures required of recreational enterprises.
0147.5.3 Design advertising media to promote a recreational area effectively.

Standard 6: Laboratory Investigation (0147.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0147.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0147.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0147.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0147.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Application (0147.S.7)
Students will apply technology to investigate real-world problems.

Technology Application Objectives
Students will:
0147.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in outdoor recreation.
- Locate, evaluate, and collect information from a variety of sources related to outdoor recreation.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0147.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0147.7.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 8: Process/Work Place Skills (0147.S.8)
Students will demonstrate personal and group workplace skills.

Process/Work Place Skills Objectives
Students will:
0147.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0147.8.2 Explore careers available in outdoor recreation.
0147.8.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
0147.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0147.8.5 Demonstrate correct language usage in all oral and written work.
0147.8.6 Perform effectively in both leadership and non-leadership roles.
0147.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0147.8.8 Participate as a team member to complete a variety of assignments.

Poultry Science and Production

This agricultural science course is designed to give students a working knowledge of the poultry industry, which includes chickens, turkeys and other avian species. The course provides an understanding of breeds, animal health, animal nutrition, anatomy and physiology, selection and economic and marketing principles related to employment. Students will develop a working knowledge of land use and poultry production to maintain an economical level of production. Upon completion course students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Orientation to the Poultry Industry (0148.S.1)
Students will explore different facets of the poultry industry.

Poultry Industry Objectives
Students will:
0148.1.1 Describe the importance of the poultry industry to the state and national economy.
0148.1.2 Identify different types of poultry enterprises.
0148.1.3 Relate consumption trends in poultry products.
0148.1.4 Identify and analyze career opportunities in the poultry industry.

Standard 2: Selection for Production (0148.S.2)
Students will use industry standards for poultry selection.

Selection for Production Objectives
Students will:
0148.2.1 List the classes of poultry and identify common breeds.
0148.2.2 Describe characteristics of birds that relate to productivity.
0148.2.3 Explain criteria to consider in selecting a breed for various types of production.
0148.2.4 Describe factors that influence chick purchase decisions.
0148.2.5 Describe characteristics associated with high egg production and procedures used in culling.
0148.2.6 Describe selection characteristics of parent and grandparent seed stock lines.

Standard 3: Nutrition and Management (0148.S.3)
Students will study factors that affect profitability.

Nutrition and Management Objectives
Students will:
0148.3.1 Describe factors that affect cost of poultry and egg production.
0148.3.2 Determine facility and equipment requirements for various poultry enterprises.
0148.3.3 Formulate rations for laying flocks, turkeys and broilers.
0148.3.4 Describe methods of disease and parasite control.
0148.3.5 Explain environmentally friendly methods of litter and dead bird disposal.
0148.3.6 Use computer programs to maintain inventory, expenses, income and other pertinent records.

Standard 4: Poultry Health and Management (0148.S.4)
Students will recognize best management practices for flock health.

Poultry Health and Management Objectives
Students will:
0148.4.1 Determine the type of care and housing facilities needed for poultry.
0148.4.2 Identify mechanical injury and treatment requirements.
0148.4.3 Identify signs/symptoms of disease and parasites, as well as prevention and treatment.
0148.4.4 Utilize techniques in administration of medicine and immunization.

0148.4.5 Design and utilize a flock health program in poultry production.

Standard 5: Anatomy and Physiology (0148.S.5)
Students will utilize the fundamentals of anatomy and physiology in the production of poultry.

Anatomy and Physiology Objectives
Students will:
0148.5.1 Identify the major parts and functions of the anatomy of various types of poultry.
0148.5.2 Identify the major parts and functions of the digestive system.
0148.5.3 Identify the major parts and functions of the reproductive system.
0148.5.4 Identify the functions of the skeletal, muscular, nervous, hormonal, respiratory, circulatory and excretory system as they relate to poultry management.
0148.5.5 Identify and explain modern poultry breeding techniques.
0148.5.6 Analyze and explain data utilizing genotypic information to form a superior poultry program.

Standard 6: Solid Waste (0148.S.6)
Students will explore strategies for handling poultry waste.

Solid Waste Objectives
Students will:
0148.6.1 Describe sources of solid waste associated with poultry industries.
0148.6.2 Explain hazards in solid waste materials and disposal.
0148.6.3 Describe ways of disposing of solid waste.
0148.6.4 Identify NRCS and SCS programs available for assistance in litter disposal.
0148.6.5 Explain recycling.
0148.6.6 Describe composting.
0148.6.7 Identify methods and benefits of composting.

Standard 7: Marketing (0148.S.7)
Students will demonstrate competencies in marketing livestock.

Marketing Objectives
Students will:
0148.7.1 Research and study various livestock marketing techniques.
0148.7.2 Identify transportation and safety methods for livestock handling.
0148.7.3 Research types of laws, regulations and licenses needed for modern livestock sales.
0148.7.4 Analyze costs of owning and operating a livestock business.

Standard 8: Leadership and Communication (0148.S.8)
Students will demonstrate leadership in the poultry industry.

Leadership and Communication Objectives
Students will:
0148.8.1 Present written and oral reasons in poultry judging events.
0148.8.2 Participate in FFA meetings and activities.
0148.8.3 Prepare and present speeches on issues involving the poultry industry using information available from magazines, trade journals, the Internet and other sources.

Standard 9: Technology Applications (0148.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0148.9.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in poultry production.
- Locate, evaluate, and collect information from a variety of sources related to poultry production.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0148.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0148.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to poultry production.

0148.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of poultry production.

Standard 10: Process/Workplace Skills in Agribusiness (0148.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:

0148.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0148.10.2 Explore careers available in agribusiness.

0148.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.

0148.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0148.10.5 Demonstrate correct language usage in all oral and written work.

0148.10.6 Perform effectively in both leadership and non-leadership roles.

0148.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0148.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Lab Investigation (0148.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Lab Investigation Objectives
Students will:

0148.11.1 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0148.11.2 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0148.11.3 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

0148.11.4 Conduct a supervised agricultural experience program with appropriate records.

Small Animal Care and Management

This course is designed to give students a working knowledge of the small animal care industry, which includes dogs, cats, birds, reptiles and other pets. The course provides an understanding of breeds, animal health, nutrition, training, anatomy and physiology, grooming, economic and marketing principles and related employment skills. Students will develop a thorough knowledge of small animals, their management and a keen business sense relating to small animals. Upon completion of this course, students will have the skills needed for an entry-level position or entrance into a degree program.

Standard 1: Leadership (0149.S.1)
Students will demonstrate leadership skills for success in the small animal industry.

Leadership Objectives
Students will:
0149.1.1 Identify FFA and it's components.
0149.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0149.1.3 Identify appropriate career opportunities in the small animal care industry.
0149.1.4 Draft a resume, fill out a job application, and demonstrate job seek/keep skills.
0149.1.5 Develop personal relation and communication skills.
0149.1.6 Identify animal welfare ethics and other issues.
0149.1.7 Develop a working relationship with local veterinarians.

Standard 2: History and Selection of Animals (0149.S.2)
Students will provide background information and describe the desirable characteristics of domestic animals.

Animals Objectives
Students will:
0149.2.1 Relate the history of domestic animals to modern animal production.
0149.2.2 Describe and classify small animals according to purposes/uses.
0149.2.3 Identify breeds of small animals (dogs, cats, birds, reptiles, etc.).
0149.2.4 Relate the characteristics of breeds to methods of selection.
0149.2.5 Be able to differentiate between domestic and exotic animals.

Standard 3: Training, Handling and Restraint (0149.S.3)
Students will demonstrate safe handling and restraining techniques.

Training, Handling and Restraint Objectives
Students will:
0149.3.1 Identify and use tools related to training and handling/restraint of small animals.
0149.3.2 Identify methods and techniques used in restraint and training of small animals.
0149.3.3 Utilize basic commands and training methods.
0149.3.4 Identify AKC guidelines for instructing dogs.
0149.3.5 Utilize safety practices in training and handling.

Standard 4: Grooming and Clipping (0149.S.4)
Students will demonstrate skills in grooming and clipping.

Grooming and Clipping Objectives
Students will:
0149.4.1 Utilize safety practices in grooming and clipping small animals.
0149.4.2 Identify tools used in grooming.
0149.4.3 Describe grooming practices (bathing, clipping, nail trimming, combing/brushing).
0149.4.4 Use proper care in applying topical medications.

Standard 5: Anatomy and Physiology (0149.S.5)
Students will utilize the fundamentals of anatomy and physiology in caring for small animals.

Anatomy and Physiology Objectives
Students will:
0149.5.1 Identify the major parts and functions of the skeletal system.
0149.5.2 Identify the major parts and functions of the muscular system.
0149.5.3 Identify the major parts and functions of the nervous system.
0149.5.4 Identify the major parts and functions of the endocrine system.
0149.5.5 Identify the major parts and functions of the respiratory system.
0149.5.6 Identify the major parts and functions of the circulatory system.
0149.5.7 Identify the major parts and functions of the reproductive system.
0149.5.8 Identify the major parts and functions of the excretory system.
0149.5.9 Identify the major parts and functions of the digestive system.
0149.5.10 Explain the difference between ruminant and monogastric systems.
0149.5.11 Describe functions of other small animals systems (avian, rabbits, reptiles).

Standard 6: Animal Health and Management (0149.S.6)
Students will demonstrate competencies in animal health and management.

Animal Health and Management Objectives
Students will:
0149.6.1 Determine the type of care and housing facilities needed.
0149.6.2 Identify mechanical injury and basic first aid requirements.
0149.6.3 Identify signs/symptoms of disease, as well as prevention and treatment.
0149.6.4 Utilize techniques in administering medicine and immunizing.

Standard 7: Nutrition (0149.S.7)
Students will describe the role of nutrition in small animal care.

Nutrition Objectives
Students will:
0149.7.1 Define terms associated with nutrition.
0149.7.2 List and describe the basic nutrients and their functions.
0149.7.3 Analyze pet food labels and determine the nutritional value of feeds and feedstuffs.
0149.7.4 Identify signs of nutritional deficiencies.
0149.7.5 Identify feeding and care requirements throughout life cycle and pregnancy.

Standard 8: Marketing (0149.S.8)
Students will demonstrate competencies in marketing small animals.

Marketing Objectives
Students will:
0149.8.1 Explore types of markets available.

0149.8.2 Identify transportation methods.
0149.8.3 Research types of laws, regulations and licenses needed in local area.
0149.8.4 Analyze costs of owning and operating a small animal care business.

Standard 9: Technology Applications (0149.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0149.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in agribusiness.
- Locate, evaluate, and collect information from a variety of sources related to agribusiness.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0149.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0149.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to agribusiness.
0149.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of agribusiness.

Standard 10: Process/Workplace Skills in Agribusiness (0149.S.10)
Students will demonstrate personal and group workplace skills.

Agribusiness Objectives
Students will:
0149.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0149.10.2 Explore careers available in agribusiness.
0149.10.3 Use a variety of sources to investigate the educational requirements of various careers in agribusiness and related sciences.
0149.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0149.10.5 Demonstrate correct language usage in all oral and written work.
0149.10.6 Perform effectively in both leadership and non-leadership roles.
0149.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0149.10.8 Participate as a team member to complete a variety of assignments.

Standard 11: Laboratory Investigation (0149.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0149.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0149.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0149.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0149.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Soil And Plant Science (Agronomy)

This area of study is designed to provide students with scientific knowledge and experiences essential to careers in soil and plant science. The course includes major units in soil formation, soil properties, land classification, fertility, plant growth and the impact of agriculture on the environment.

Standard 1: Orientation to Soil and Plant Science (0150.S.1)
Students will soil and plant science.

Soil and Plant Science Objectives
Students will:
0150.1.1 Research career opportunities in soil and plant science.
0150.1.2 Describe the impact of agriculture on the environment.
0150.1.3 List and describe the function of federal, state and local entities and interest groups concerned with soil and plant science.
0150.1.4 Examine the role of soil and plants in the ecosystem.

Standard 2: Leadership Development (0150.S.2)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0150.2.1 Participate in meetings using parliamentary law.
0150.2.2 Use interpersonal skills in team problem solving.
0150.2.3 Prepare and deliver a brief presentation on an agronomic topic.

Standard 3: Provide Work-Based Experiential Learning Opportunities (0150.S.3)
Students will participate in a work-base experience program.

Work-Based Objectives
Students will:
0150.3.1 Explore opportunities for work-based experience through supervised experience programs.
0150.3.2 Define record keeping terms for supervised experience programs.
0150.3.3 Develop budgets for potential supervised experience programs.

Standard 4: Soil Origin and Development (0150.S.4)
Students will identify how soil is formed and surveyed.

Soil Origin and Development Objectives
Students will:
0150.4.1 Determine how soil is formed.
0150.4.1 Interpret information from soil surveys.

Standard 5: Physical Properties of Soil (0150.S.5)
Students will identify the various physical properties of soil samples.

Soil Objectives
Students will:
0150.5.1 Define and determine soil depth.
0150.5.2 Define and determine soil texture.
0150.5.3 Define and determine soil structure.
0150.5.4 Define and determine soil permeability.

0150.5.5 Define and determine drainage.
0150.5.6 Define and determine slope.

Standard 6: Classification of Soils Into Soil Series and Land Capability Classes (0150.S.6)
Students will identify the various classification of soil.

Classification of Soils Objectives
Students will:
0150.6.1 Classify soils by common physical properties.
0150.6.2 Describe soil series of the region.
0150.6.3 Determine land capability classes and recommend appropriate land management practices.

Standard 7: Plant Nutrition and Soil Fertility (0150.S.7)
Students will identify the various functions of plant nutrition and soil fertility.

Plant Nutrition and Soil Fertility Objectives
Students will:
0150.7.1 List and describe the functions of macro and micronutrients.
0150.7.2 Describe and identify plant nutrient deficiencies.
0150.7.3 Explain the function and management of soil pH.
0150.7.4 Describe and engage in the process of soil testing.
0150.7.5 Interpret and apply data generated by soil testing.
0150.7.6 List and compare sources of plant nutrients.
0150.7.7 Identify nutrient deficiencies and plant diseases.
0150.7.8 Conduct plant growth experiments.
0150.7.9 Use soil-testing equipment.

Standard 8: Plant Structures and their Functions (0150.S.8)
Students will identify the various plant structures and their functions.

Plant Structures Objectives
Students will:
0150.8.1 Explain basic plant production requirements.
0150.8.2 Identify the major parts of a plant.
0150.8.3 Describe the function of the major parts of a plant.
0150.8.4 Demonstrate knowledge of plant growth processes photosynthesis, respiration and transpiration.

Standard 9: Row Crop Management (0150.S.9)
Students will identify the various methods to row crop management.

Row Crop Management Objectives
Students will:
0150.9.1 Identify row crops common to the area.
0150.9.2 Describe cultural requirements and production practices of row crops.
0150.9.3 List and describe harvesting methods.

Standard 10: Forage Management (0150.S.10)
Students will identify the various methods to row crop management.

Forest Management Objectives
Students will:
0150.10.1 Identify forage crops common to the area.
0150.10.2 Describe cultural requirements and production practices of forage crops.
0150.10.3 List and describe harvesting methods.

Standard 11: Soil and Water Conservation (0150.S.11)
Students will identify the various methods of soil and water conservation.

Soil and Water Conservation Objectives
Students will:
0150.11.1 Define and provide examples of erosion.
0150.11.2 Explain agricultural practices to conserve soil and reduce pollution (stewardship).
0150.11.3 Predict impacts of erosion.
0150.11.4 Identify and describe best management practices to prevent soil erosion.
0150.11.5 Utilize the World Wide Web to explore specialty areas in soil and plant science.

Standard 12: Laboratory Investigation (0150.S.12)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0150.12.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0150.12.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0150.12.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0150.12.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 13: Technology Applications (0150.S.13)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0150.13.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in soil and plant science.
- Locate, evaluate, and collect information from a variety of sources related to soil and plat science.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0150.13.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0150.13.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to soil and plant science.
0150.13.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of soil and plant science.

Standard 14: Process/Workplace Skills (0150.S.14)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0150.14.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0150.14.2 Explore careers available in soil and plant science.
0150.14.3 Use a variety of sources to investigate the educational requirements of various careers in soil and plant science.
0150.14.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0150.14.5 Demonstrate correct language usage in all oral and written work.
0150.14.6 Perform effectively in both leadership and non-leadership roles.
0150.14.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0150.14.8 Participate as a team member to complete a variety of assignments.

Forestry 1

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Leadership Develop (0182.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Develop Objectives
Students will:
0182.1.1 Identify the year FFA was formed.
0182.1.2 Name the author of the creed.
0182.1.3 Identify the location of the state and national convention.
0182.1.4 Name the state and national FFA advisor.
0182.1.5 Name the degree levels in FFA.
0182.1.6 Identify parts of the emblem.

Standard 2: Safety Principles in Forestry (0182.S.2)
Students will identify and utilize appropriate safety equipment and regulations.

Safety Principles in Forestry Objectives
Students will:
0182.2.1 Wear appropriate safety gear.
0182.2.2 Maintain a safe working environment.
0182.2.3 Identify safety hazards of fire line construction and mop-up.

Standard 3: Identify Economic Trees in West Virginia (0182.S.3)
Students will demonstrate the skill of tree identification with various methods.

Economic Trees in West Virginia Objectives
Students will:
0182.2.1 Identify the following trees:
- Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine

0182.2.2 Identify by leaves.
0182.2.3 Identify by bark.
0182.2.4 Identify by taste and smell.
0182.2.5 Identify by twigs.
0182.2.6 Identify by fruit.
0182.2.7 Understand tree morphology.

Standard 4: Forest Fire Fighting Procedures (0182.S.4)
Students will demonstrate correct methods and use of proper equipment to control forest fires.

Forest Fire Objectives
Students will:
0182.4.1 Construct fire line using hand tools.
0182.4.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
0182.4.3 Extinguish remaining fire spots after main fire is contained (mop-up).
0182.4.4 Determine direction for fire line construction.
0182.4.5 Repair and service equipment after fire is extinguished.

0182.4.6 Use backpack pump to fight fire directly.

Standard 5: Forest Measurement Techniques (0182.S.5)
Students will identify and demonstrate forest measurement techniques.

Forest Measurement Techniques Objectives
Students will:
0182.5.1 Set up instrument for surveying.
0182.5.2 Use compass to maintain direction.
0182.5.3 Make linear measurements using surveyor's chain with compass.
0182.5.4 Make linear measurements by pacing with compass.
0182.5.5 Calculate the number of acres in a timber tract.
0182.5.6 Use hand/staff compass to determine bearing or Azimuth.
0182.5.7 Identify units of measurement (mile, rod, chain and acre).

Standard 6: Silviculture Treatment for Timber Stand Improvement (0182.S.6)
Students will identify silvicultural procedures.

Silviculture Treatment Objectives
Students will:
0182.6.1 Determine major forest type and primary uses.
0182.6.2 Determine proper spacing using D+6 rule.
0182.6.3 Use increment borer to determine age and growth rate.
0182.6.4 Select and utilize pruning and thinning methods for a timber stand.
0182.6.5 Fell and limb trees.

Standard 7: Laboratory Investigations/Hands-On Learning (0182.S.7)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0182.7.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0182.7.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0182.7.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0182.7.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Chainsaw Safety (0183.S.1)
Students will demonstrate proper safety techniques for chainsaw usage.

Chainsaw Safety Objectives
Students will:
0183.1.1 Identify and use safety clothing and equipment.
0183.1.2 Use proper starting techniques.
0183.1.3 Identify proper safety rules with 100% accuracy.
0183.1.4 Identify and correct hazardous operational conditions.

Standard 2: Chainsaw Maintenance (0183.S.2)
Students will demonstrate proper chainsaw maintenance.

Chainsaw Maintenance Objectives
Students will:
0183.2.1 Properly sharpen chain.
0183.2.2 Determine and adjust chain for proper tension.
0183.2.3 Demonstrate proper cleaning and storage of chainsaw.
0183.2.4 Replace sprocket on chainsaw.
0183.2.5 Replace bar on chainsaw.
0183.2.6 Replace broken chain link.
0183.2.7 Clean and service carburetor and air cleaner.
0183.2.8 Replace chain clutch as needed.
0183.2.9 Adjust carburetor for maximum efficiency.
0183.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber (0183.S.3)
Students will correctly calculate the volume of standing timber using various tools and scales.

Volume of Standing Timber Objectives
Students will:
0183.3.1 Define and calculate board foot and cord wood volumes.
0183.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
0183.3.3 Determine number of logs per tree using tree stick or clinometers.
0183.3.4 Record volume number of individual trees using tally sheet method.
0183.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0183.3.6 Calculate volume of pulpwood by cords.

Standard 4: Wildlife Habitat Management (0183.S.4)
Students will demonstrate proper techniques to develop wild life habitat through forestry practices.

Wildlife Habitat Management Objectives
Students will:
0183.4.1 Monitor and improve water quality.
0183.4.2 Improve habitat for bird, fish and game.
0183.4.3 Understand the importance of the forest, field and edge.
0183.4.4 Identify potential den and mast trees.

Standard 5: Laboratory Investigations – Hands-On Learning (0183.S.5)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:

0183.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

0183.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

0183.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0183.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Technology Applications in Forestry (0183.S.6)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0183.6.1 Use computers and the World Wide Web (WWW) to:

- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0183.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0183.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

0183.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Personal Leadership Skills Development (0184.S.1)
Students will conduct research in the forest industry and make presentations.

Personal Leadership Skills Development Objectives
Student will:
0184.1.1 Describe the parts of a good speech.
0184.1.2 Explain how to present a desirable speech.
0184.1.3 Correctly conduct research in topics concerning forestry.
0184.1.4 Deliver a speech on a forestry topic.

Standard 2: Advanced Dendrology Skills (0184.S.2)
Students will demonstrate advanced skills in tree identification.

Advanced Dendrology Skills Objectives
Students will:
0184.2.1 Identify by flowers.
0184.2.2 Identify by growth characteristics.
0184.2.3 Identify by site conditions.
0184.2.4 Identify by distribution.

Standard 3: Safety Training in Forestry (0184.S.3)
Students will demonstrate safety practices with equipment used in forestry.

Safety Training Objectives
Students will:
0184.3.1 Demonstrate safety with hand tools.
0184.3.2 Demonstrate safety with chainsaws.
0184.3.3 Demonstrate safety with tractors.
0184.3.4 Demonstrate safety on the fire line.

Standard 4: Operation and Maintenance of Forestry Equipment (0184.S.4)
Students will demonstrate operation and maintenance of equipment used in forestry.

Forestry Equipment Objectives
Students will:
0184.4.1 Demonstrate the proper use and maintenance of hand tools.
0184.4.2 Demonstrate the proper use and maintenance of chainsaws.
0184.4.3 Demonstrate the proper use and maintenance of tractors.
0184.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Silvicultural Applications for Timber Stands (0184.S.5)
Students will apply silviculture practices in timber stands.

Timber Stands Objectives
Students will:
0184.5.1 Demonstrate forest reproduction techniques.

0184.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
0184.5.3 Define clear-cut.

Standard 6: Laboratory Investigations/Hands-on Learning (0184.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0184.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0184.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0184.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0184.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0184.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0184.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0184.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0184.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0184.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Parliamentary Procedure (0185.S.1)
Students will demonstrate parliamentary procedure.

Parliamentary Procedure Objectives
Students will:
0185.1.1 Identify proper procedures for conducting a meeting.
0185.1.2 Write and present a committee report.
0185.1.3 Identify components of a program of activities.

Standard 2: Safety Procedures in Fire Line Construction (0185.S.2)
Students will demonstrate procedures to safely construct a fire line.

Fire Line Construction Objectives
Students will:
0185.2.1 Explain fire line safety.
0185.2.2 Explain fire line construction.
0185.2.3 Explain forest fire mop-up.
0185.2.4 Explain the use of topographic maps in locating access roads and trails.
0185.2.5 Explain the use of topographic maps in fire location.
0185.2.6 Repair, service and store equipment.

Standard 3: Use of Forest Surveying Equipment (0185.S.3)
Students will utilize equipment necessary to survey a forest.

Forest Surveying Equipment Objectives
Students will:
0185.3.1 Interpret surface features using aerial photography and topographic maps.
0185.3.2 Conduct a boundary survey using a hand compass and pacing.
0185.3.3 Visit a courthouse and conduct a title search.
0185.3.4 Plot bearings from deeds.
0185.3.5 Calculate percent slope using a clinometer.
0185.3.6 Orientate topographic map using hand compass.
0185.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Utilization of Best Management Practices (0185.S.4)
Students will describe the best management practices in forest road construction.

Best Management Practices Objectives
Students will:
0185.4.1 Lay out roads in compliance with West Virginia forest standards.
0185.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0185.4.3 Describe the process of installing culverts, water breaks and "woods" bridges.
0185.4.4 Design skid roads.
0185.4.5 Monitor water quality.
0185.4.6 Reseed skid trails and log landings.

Standard 5: Wood Products Utilization (0185.S.5)
Students will process, measure and market forest products.

Wood Products Utilization Objectives
Students will:
0185.5.1 Demonstrate competency in felling, bucking and skidding selected trees.
0185.5.2 Scale logs and lumber.
0185.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Laboratory Investigations – Hands-On Learning (0185.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0185.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0185.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0185.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0185.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications in Forestry (0185.S.7)
Students will apply technology to investigate real-world problems.

Forestry Objectives
Students will:
0185.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0185.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0185.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
0185.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Forestry Equipment: Identification and Use (0186.S.1)
Students will demonstrate safe use of forestry equipment.

Forestry Equipment Objectives
Students will:
0186.1.1 Identify and use the following:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

Standard 2: Conduct a Timber Cruise (0186.S.2)
Students will demonstrate skills needed to conduct a timber cruise using various equipment.

Timber Cruise Objectives
Students will:
0186.2.1 Mark boundaries and corners of tract.
0186.2.2 Use compass to direct cruising operation.
0186.2.3 Measure distance between plot center (by pacing).
0186.2.4 Record trees using tally sheet method.
0186.2.5 Use wedge prism (BAF 10 or BAF 20).
0186.2.6 Calculate board foot volumes using double log scale.

Standard 3: Application of Best Management Practices (0186.S.3)
Students will apply best management practices in a forestry setting.

Application of Best Management Practices Objectives
Students will:
0186.3.1 Lay out roads in compliance with West Virginia forest standards.
0186.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0186.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
0186.3.4 Design skid roads.
0186.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
0186.3.6 Scale logs and lumber.
0186.3.7 Monitor water quality.
0186.3.8 Reseed skid trails and log landings.

Standard 4: Laboratory Investigations – Hands-On Learning (0186.S.4)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0186.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0186.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0186.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

0186.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Technology Applications in Forestry (0186.S.5)
Students will apply technology to investigate real-world problems.

Technology Applications in Forestry Objectives
Students will:

0186.5.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in forestry.
- Locate, evaluate, and collect information from a variety of sources related to forestry.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0186.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0186.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom a assignments related to forestry.

0186.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Process/Workplace Skills in Forestry (0186.S.6)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0186.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0186.6.2 Explore careers available in forestry.

0186.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

0186.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0186.6.5 Demonstrate correct language usage in all oral and written work.

0186.6.6 Perform effectively in both leadership and non-leadership roles.

0186.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0186.6.8 Participate as a team member to complete a variety of assignments.

Forestry Science And Ecology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the forestry industry. Major instructional concepts include the scientific aspects of dendrology, silviculture, integrated wildlife management and ecology. Additionally, the student will study safety, surveying and measuring timber.

Standard 1: Leadership Development (0187.S.1)
Students will demonstrate leadership skills by developing an awareness of the FFA.

Leadership Development Objectives
Students will:
0187.1.1 Identify the year FFA was formed.
0187.1.2 Name the author of the creed.
0187.1.3 Identify the location of the state and national convention.
0187.1.4 Name the state and national FFA advisor.
0187.1.5 Name the degree levels in FFA.
0187.1.6 Identify parts of the emblem.

Standard 2: Safety (0187.S.2)
Students will identify and utilize appropriate safety procedures associated with forestry.

Safety Objectives
Students will:
0187.2.1 Wear appropriate safety gear.
0187.2.2 Maintain a safe working environment.
0187.2.3 Identify and use safety clothing and equipment.
0187.2.4 Identify proper safety rules with 100% accuracy.
0187.2.5 Identify and correct hazardous operational conditions.

Standard 3: Fire Line Safety (0187.S.3)
Students will demonstrate appropriate safety practices involved in creating a fire line.

Fire Line Safety Objectives
Student will:
0187.3.1 Identify fire fighting tools.
0187.3.2 Explain fire line safety.
0187.3.3 Explain fire line construction.
0187.3.4 Explain forest fire mop-up.
0187.3.5 Explain the use of topographic maps in location access roads and trails.
0187.3.6 Explain the use of topographic maps in fire location.

Standard 4: Forestry Equipment (0187.S.4)
Students will identify equipment associated with forestry and explain their use.

Forestry Equipment Objectives
Students will:
0187.4.1 Identify by sight:
- Tree Scale Stick, Increment Bore, Drip Torch, Fire Rake, Clinometers, Hand Compass, Soil Tube, Jacobs Staff, Staff Compass, Chaps, Hard Hat/Face, Shield, Pulaski, Tree Marking Gun, Wedge Prism, Stereoscope, Log Rule, Data Recorder, Plastic Flagging, Chainsaw, Ear Protection, Dot Grid, Dibble or Tree Planter

0187.4.2 Explain the use of each tool.

Standard 5: Dendrology (0187.S.5)
Students will demonstrate appropriate tree identification techniques.

Dendrology Objectives
Students will:
0187.5.1 Identify by leaves.
0187.5.2 Identify by bark.
0187.5.3 Identify by twigs.
0187.5.4 Identify by fruit.

Standard 6: Measurements (0187.S.6)
Students will demonstrate various methods of measurements involving forestland and product measurements.

Measurements Objectives
Students will:
0187.6.1 Organize and set up instruments for surveying.
0187.6.2 Use compass to maintain direction.
0187.6.3 Make linear measurements using surveyor's chain with compass.
0187.6.4 Make linear measurements by pacing with compass.
0187.6.5 Calculate the number of acres in a timber tract.
0187.6.6 Use hand/staff compass to determine bearing or Azimuth.
0187.6.7 Identify units of measurement (mile, rod, chain and acre.)
0187.6.8 Define and calculate board foot and cord wood volumes.
0187.6.9 Measure standing trees at diameter breast height using tree stick and diameter tape.
0187.6.10 Determine number of logs per tree using tree stick or clinometer.
0187.6.11 Record volume number of individual trees using tally sheet method.
0187.6.12 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
0187.6.13 Calculate volume of pulpwood by cords.
0187.6.14 Interpret surface features using aerial photography and topographic maps.
0187.6.15 Conduct a boundary survey using hand compass and pacing.
0187.6.16 Calculate percent slope using a clinometer.
0187.6.17 Orientate topographic map using hand compass.
0187.6.18 Mark boundaries and corners of tract.
0187.6.19 Use compass to direct cruising operation.
0187.6.20 Measure distance between plot center (by pacing).
0187.6.21 Record trees using tally sheet method.
0187.6.22 Use wedge prism (BAF 10 or BAF 20).
0187.6.23 Calculate board foot volumes using double log scale.

Standard 7: Silviculture (0187.S.7)
Students will utilize various silviculture practices.

Silviculture Objectives
Students will:
0187.7.1 Determine major forest type and primary uses.
0187.7.2 Determine proper spacing using D+6 rule.
0187.7.3 Use increment borer to determine age and growth rate.
0187.7.4 Recognize insect and disease damage and mark damaged area for salvage.
0187.7.5 Identify forest reproduction techniques.
0187.7.6 Demonstrate the technique of girdling in the process of removing undesirable trees.
0187.7.7 Define clear-cutting.

Standard 8: Wildlife (0187.S.8)
Students will demonstrate correct wildlife management skills.

Wildlife Objectives
Students will:
0187.8.1 Monitor and improve water quality.
0187.8.2 Improve habitat for bird, fish and game.
0187.8.3 Understand the importance of the forest, field and edge.
0187.8.4 Identify potential den and mast trees.

Standard 9: Best Management Practices (0187.S.9)
Students will demonstrate an awareness of best management practices used in forestry.

Best Management Practices Objectives
Students will:
0187.9.1 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
0187.9.2 Understand the importance of installing culverts, water breaks and "woods" bridges.
0187.9.3 Design skid roads.
0187.9.4 Monitor water quality.

Natural Resource Management 1

This agricultural science course is designed to provide students with science concepts and skills in natural resource management that will be useful in various occupations in the field. Major emphasis will be on the scientific concepts involving air, water, aquatic life, wildlife management and recreation. Interaction of ecosystems and their relationship to human populations will be studied. This field of study will prepare students for entry-level occupations in the natural resources area.

Standard 1: Natural Resource and the Environment (0188.S.1)
Students will describe the relationship between natural resources and the environment.

Natural Resource and the Environment Objectives
Students will:
0188.1.1 Identify exhaustible and inexhaustible resources.
0188.1.2 Explain the importance of natural resources.
0188.1.3 Describe the interaction of people with the environment.

Standard 2: Air and Quality (0188.S.2)
Students will explain the importance of air and maintaining its quality.

Air and Quality Objectives
Students will:
0188.2.1 Identify air pollutants and their sources.
0188.2.2 Describe the effect of air pollution on humans, other living things and materials.
0188.2.3 Sample, monitor and analyze air quality for physical and chemical properties.
0188.2.4 Examine wind (air) as an alternative energy source.

Standard 3: Water Quality (0188.S.3)
Students will explain the importance of water and maintaining its quality.

Water Quality Objectives
Students will:
0188.3.1 Identify sources of water and water pollutants.
0188.3.2 Explain the effect of water pollution on the ecosystem.
0188.3.3 Describe the hydroponical cycle.
0188.3.4 Identify point and non-point source pollution.
0188.3.5 Describe wetlands, their use, importance and preservation.
0188.3.6 Identify uses of water in agriculture.
0188.3.7 Explain methods of managing wastewater.
0188.3.8 Determine composition of wastewater using water-testing equipment.
0188.3.9 Explain methods of protecting water sources.

Standard 4: Aquatic Life (0188.S.4)
Students will demonstrate aquatic life and natural resource management skills.

Aquatic Life Objectives
Students will:
0188.4.1 Identify game fish species and other aquatic wildlife.
0188.4.2 Explain water quality requirements for aquatic wildlife.
0188.4.3 Explain fishing laws and regulations.
0188.4.4 Describe fish hatchery techniques.
0188.4.5 Check for pond oxygen deficiency and prescribe remedial programs.
0188.4.6 Explain stratification and fish adaptability.

0188.4.7 Identify a management plan for a designated stream, lake or pond.

Standard 5: Wildlife (0188.S.5)
Students will demonstrate of wildlife management skills.

Wildlife Objectives
Students will:
0188.5.1 Identify and classify species of birds and wildlife animals.
0188.5.2 List governmental agencies concerned with wildlife conservation.
0188.5.3 Outline a plan for stimulating native and introduced game populations.
0188.5.4 Outline a plan for hatching game bird eggs.
0188.5.5 Identify common diseases of game birds and animals.
0188.5.6 Identify practices that can be used to protect wildlife.
0188.5.7 Evaluate wildlife food and cover crops.
0188.5.8 Estimate animal populations on given areas of land.

Standard 6: Outdoor Recreation (0188.S.6)
Students will demonstrate competencies in outdoor recreation management.

Outdoor Recreation Objectives
Students will:
0188.6.1 List demands by the public for different types of outdoor recreation experiences.
0188.6.2 Recognize types of natural resources recreational areas and the service and facilities required.
0188.6.3 Recognize the income potential from various types of recreational enterprises.
0188.6.4 Identify business procedures required of a recreational enterprise.
0188.6.5 Describe local, state and federal laws pertaining to given enterprises.
0188.6.6 Design advertising media to promote a recreation area effectively.

Standard 7: Leadership (0188.S.7)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0188.7.1 Participate in FFA meetings and activities.
0188.7.2 Utilize record keeping skills in work-based experience programs (SAE).

Standard 8: Laboratory Investigations (0188.S.8)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0188.8.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0188.8.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0188.8.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0188.8.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 9: Technology Applications (0188.S.9)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0188.9.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0188.9.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0188.9.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.

0188.9.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 10: Process/Workplace Skills (0188.S.10)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0188.10.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0188.10.2 Explore careers available in natural resource management.

0188.10.3 Use a variety of sources to investigate the educational requirements of various careers in natural resource management.

0188.10.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0188.10.5 Demonstrate correct language usage in all oral and written work.

0188.10.6 Perform effectively in both leadership and non-leadership roles.

0188.10.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0188.10.8 Participate as a team member to complete a variety of assignments.

Natural Resource Management II

This agricultural science course is designed to provide students with advanced science concepts and skills in natural resource management. Major emphasis will be on soil, forestry, and land use planning including solid waste and hazardous waste disposal and soil fertility. This field of study prepares students for entry-level occupations in the area of natural resources management.

Standard 1: Occupations in Natural Resources (0189.S.1)
Students will describe the occupations related to natural resources.

Occupations in Natural Resources Objectives
Students will:
0189.1.1 Identify occupations in natural resource management.
0189.1.2 Determine requirements for occupational entry in natural resource management fields.
0189.1.3 Identify typical activities performed by natural resource workers.

Standard 2: Soils (0189.S.2)
Students will explain soils and their role in natural resource management.

Soils Objectives
Students will:
0189.2.1 Identify factors that affect soil formation and describe the significance of each.
0189.2.2 Make "feel" tests of wet and dry soil samples and classify each as sandy, loamy or clayey.
0189.2.3 Determine percentage of sand, loam and clay in soil samples and classify according to texture.
0189.2.4 Classify samples of topsoil in one of the three color groups.
0189.2.5 Determine pH values of soil.
0189.2.6 Classify soils with respect to permeability.
0189.2.7 Determine moisture content of soil.
0189.2.8 Recognize causes of soil erosion.
0189.2.9 Categorize soils into their land use capability classes.
0189.2.10 Identify appropriate erosion control measures for soils.
0189.2.11 Read soil maps and interpret terms and symbols.
0189.2.12 Develop a conservation land use plan for a farm.

Standard 3: Soil Fertility (0189.S.3)
Students will perform competencies related to maintaining soil fertility.

Soil Fertility Objectives
Students will:
0189.3.1 Collect soil samples, complete data forms and submit to a laboratory for analysis.
0189.3.2 Test soil for acidity or alkalinity and prescribe remedial measures.
0189.3.3 Make plant tissue analyses.
0189.3.4 Explain analysis data on a fertilizer tag.
0189. 3.5 Identify macronutrients and their deficiency symptoms.

Standard 4: Forestry (0189.S.4)
Students will explain the role of forestry principles in natural resource management.

Forestry Objectives
Students will:
0189.4.1 Relate benefits of forest resources to land, human and economic requirements.
0189.4.2 Recognize and name forest products.
0189.4.3 Identify tree parts and their functions.

0189.4.4 Identify common tree species.
0189.4.5 Plant tree seedlings using approved practices.
0189.4.6 Identify common tree pests and diseases.
0189.4.7 Prescribe control measures for pests and diseases.
0189.4.8 Describe the effect of forest fires on the forest floor.
0189.4.9 Identify fire suppression tools and equipment and state their functions.

Standard 5: Land Use Planning (0189.S.5)
Students will describe the principles of land use planning.

Land Use Planning Objectives
Students will:
0189.5.1 Outline steps in the land use planning process.
0189.5.2 Assemble information pertinent to developing a comprehensive plan.
0189.5.3 Describe functions of comprehensive plans and zoning ordinances.
0189.5.4 Obtain distances by pacing and using steel tapes.
0189.5.5 Use appropriate equipment to conduct a basic survey.
0189.5.6 Give legal descriptions of selected plots of land.
0189.5.7 Run a traverse with the surveyor's staff compass.

Standard 6: Minerals (0189.S.6)
Students will explain the role of minerals in natural resource management.

Minerals Objectives
Students will:
0189.6.1 Identify and classify samples of rocks and minerals common to the state.
0189.6.2 Describe formation of coal in the earth's crust.
0189.6.3 List functions of common minerals.
0189.6.4 Describe procedures in locating, extracting and processing minerals.
0189.6.5 Describe the impact of mining on the environment.
0189.6.6 Identify methods of mineral conservation.
0189.6.7 Identify a plan for restoration of an area that has been disturbed by mineral extraction.

Standard 7: Solid Waste (0189.S.7)
Students will describe the concepts of solid waste management.

Solid Waste Objectives
Students will:
0189.7.1 Describe kinds and sources of solid waste.
0189.7.2 Explain hazards in solid waste materials and disposal.
0189.7.3 Describe methods of solid waste disposal.
0189.7.4 Explain recycling.
0189.7.5 Describe composting.
0189.7.6 Explore methods and benefits of composting.

Standard 8: Hazardous Waste (0189.S.8)
Students will describe the concepts of hazardous waste management.

Hazardous Waste Objectives
Students will:
0189.8.1 Explain hazardous waste.
0189.8.2 Describe ecotoxicology.
0189.8.3 Explain disposing of hazardous waste.
0189.8.4 Explain safety procedures and clean-up of spills.

Standard 9: Leadership (0189.S.9)
Students will demonstrate leadership skills in natural resource management.

Leadership Objectives
Students will:
0189.9.1 Participate in FFA meetings and activities.

Standard 10: Supervised Agricultural Experience Program (SAE) (0189.S.10)
Students will conduct a supervised agricultural experience program.

SAE Objectives
Students will:
0189.10.1 Conduct an experience program in the natural resource management area.
0189.10.2 Maintain appropriate records on the experience program.

Standard 11: Laboratory Investigations (0189.S.11)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigations Objectives
Students will:
0189.11.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0189.11.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0189.11.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0189.11.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 12: Technology Applications (0189.S.12)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0189.12.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in natural resource management.
- Locate, evaluate, and collect information from a variety of sources related to natural resource management.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0189.12.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0189.12.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to natural resource management.
0189.12.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of natural resource management.

Standard 13: Process/Workplace Skills (0189.S.13)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:
0189.13.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize,

analyze, and report data.

0189.13.2 Explore careers available in natural resource management.

0189.13.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.

0189.13.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0189.13.5 Demonstrate correct language usage in all oral and written work.

0189.13.6 Perform effectively in both leadership and non-leadership roles.

0189.13.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0189.13.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Leadership and Communication Development (0190.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0190.1.1 Identify FFA history.
0190.1.2 Demonstrate proper use of parliamentary procedure.
0190.1.3 Participate in FFA activities.
0190.1.4 Prepare and deliver a brief presentation on a wildlife or natural resource topic.

Standard 2: History of Wildlife Management (0190.S.2)
Students will describe the importance of wildlife management and its impact on conservation.

History of Wildlife Management Objectives
Students will:
0190.2.1 Define and describe wildlife trends and their impact on management.
0190.2.2 Identify wildlife legalities and ethics.
0190.2.3 Define natural resources conservation.

Standard 3: Concepts of Wildlife Management (0190.S.3)
Students will describe the relationships between wildlife, humans and the ecosystem.

Concepts of Wildlife Management Objectives
0190.3.1 Define succession stages related to wildlife management.
0190.3.2 Describe carrying capacity as related to wildlife.
0190.3.3 Define horizontal and vertical structuring.
0190.3.4 Explain ecological principles and their application to wildlife management.

Standard 4: Habitat Management Practices (0190.S.4)
Students will determine the relationship between wildlife and the environment with approved practices in managing wildlife habitat.

Habitat Management Practices Objectives
Students will:
0190.4.1 Explain ecological principles applied to fish and wildlife.
0190.4.2 Design a wildlife management plan.
0190.4.3 Identify forest management practices for improving habitat.
0190.4.4 Identify agricultural management practices for improvement of habitat.
0190.4.5 Define and describe wetlands and their use.
0190.4.6 Identify government assistance available for habitat improvement.
0190.4.7 Construct and erect wildlife feeders/nest boxes.

Standard 5: Animal Life Histories (0190.S.5)
Students will use technology to identify the characteristics of wildlife and the relationship between species.

Animal Life Histories Objectives
Students will:

0190.5.1 Identify life cycles of wildlife species.
0190.5.2 Describe interrelationship of wildlife species.
0190.5.3 Identify common relationships between humans and wildlife.
0190.5.4 Search the Internet to secure wildlife information.

Standard 6: Water and Water Quality (0190.S.6)
Students will determine the relationships between water and the environment and the recommended practices for conserving these resources.

Water Objectives
Students will:
0190.6.1 Identify sources of water and water pollutants.
0190.6.2 Explain the effects to water pollution on the ecosystem.
0190.6.3 Identify point and non-point source pollution and describe possible controls.
0190.6.4 Describe wetlands, their use, importance and preservation.
0190.6.5 Explain methods of protecting water sources.

Standard 7: Wildlife Values as a Resource (0190.S.7)
Students will describe the benefit of wildlife as a resource to society.

Wildlife Values Objectives
Students will:
0190.7.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
0190.7.2 Define recreational values of fish and wildlife.
0190.7.3 Describe social values of fish and wildlife.
0190.7.4 Identify esthetic values of fish and wildlife resources.
0190.7.5 Describe scientific and educational values of fish and wildlife.
0190.7.6 Evaluate negative impact of wild animals on humans.

Standard 8: Develop a Work-Based Experiential Program (SAE) in Wildlife Management (0190.S.8)
Students will explore careers and learn the rational for and plan a SAE.

SAE Objectives
Students will:
0190.8.1 Define and explain supervised experience programs in agricultural and natural resources.
0190.8.2 Explore opportunities for work-based learning in natural resources.
0190.8.3 Define record keeping terms for supervised experience programs.
0190.8.4 Establish a supervised experience program in agriculture or natural resources.

Grounds Maintenance

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation.

Standard 1: Leadership and Communication Development (0201.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0201.1.1 Participate in FFA activities and programs.
0201.1.2 Prepare and deliver short speeches.
0201.1.3 Identify interview and employment readiness skills.
0201.1.4 Prepare a resume.

Standard 2: Grounds Maintenance Tools and Equipment (0201.S.2)
Students will practice and demonstrate safety with ground maintenance tools, equipment and activities.

Grounds Maintenance Tools and Equipment Objectives
Students will:
0201.2.1 Identify tools and equipment used in grounds maintenance.
0201.2.2 Perform maintenance and service operations on tools and equipment.
0201.2.3 Use tools and equipment safely under job site conditions.
0201.2.4 Identify and safely use potentially hazardous fuels.

Standard 3: Control Pests in Lawns, Flowers and Shrubs (0201.S.3)
Students will explain the practices of safe pesticide use and the concept of integrated pest management.

Control Pests in Lawns, Flowers and Shrubs Objectives
Students will:
0201.3.1 Identify, calibrate and safely use equipment.
0201.3.2 Identify and use personal safety clothing and equipment.
0201.3.3 Identify common pests, diseases and appropriate control techniques including integrated pest management (IPM).
0201.3.4 Read and demonstrate understanding of pesticide labels.

Standard 4: Plant and Maintain Lawns, Flower Beds, and Shrubs (0201.S.4)
Students will demonstrate practices pertaining to the establishment and maintenance of lawns, flower beds and shrubs.

Plant and Maintain Lawns, Flower Beds, and Shrubs Objectives
Students will:
0201.4.1 Identify safe and appropriate mowing techniques.
0201.4.2 Use an edger following safety procedures.
0201.4.3 Aerate and dethatch turf.
0201.4.4 Irrigate lawn, flowers and shrubs.
0201.4.5 Take soil samples using correct procedures.
0201.4.6 Analyze soil test results and determine fertilizer needs.
0201.4.7 Apply fertilizer and lime to various areas.
0201.4.8 Prune shrubs according to recommended practices.
0201.4.9 Mulch landscape plants.
0201.4.10 Provide appropriate winter protection for plants.

Standard 5: Construct and Maintain Grounds Structures (0201.S.5)
Students will build and maintain permanent structures within a landscaped design.

Grounds Structures Objectives
Students will:
0201.5.1 Mix and pour concrete.
0201.5.2 Build and maintain wood structures.
0201.5.3 Seal asphalt walks and driveways.

Standard 6: Developing Work-Based Experiential Program (SAE) (0201.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0201.6.1 Explore opportunities for supervised agricultural experience programs.
0201.6.2 Establish a supervised agricultural experience program in grounds maintenance.
0201.6.3 Maintain records of experience program activities, expenses and earnings.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Leadership Development (0212.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0212.1.1 Demonstrate an awareness of FFA and its components.
0212.1.2 Utilize record-keeping skills in work-based experience programs.
0212.1.3 Develop and exhibit communication skills.
0212.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0212.1.5 Demonstrate personal and social skills.
0212.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Plant Classification and Identification (0212.S.2)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0212.2.1 Develop an understanding of the natural classification system for the plant kingdom.
0212.2.2 Identify plant species and explore their benefit to people.
0212.2.3 Identify and research plants that are important to the greenhouse industry.
0212.2.4 Describe the plant processes involved with plant growth and development.
0212.2.5 List plant growth regulators and document their effects on plants.
0212.2.6 Explain how essential elements become available for plant use.
0212.2.7 Identify and document the effects of environmental factors on plant growth.
0212.2.8 Compare and contrast types of plant-growing media.
0212.2.9 Determine appropriate amendments for optimum plant growth.
0212.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Plant Processes and Propagation (0212.S.3)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0212.3.1 Perform methods of propagating plants.
0212.3.2 Manipulate total environment from juvenile to mature plant.
0212.3.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Pest Management (0212.S.4)
Students will identify proper pesticide use and pest management.

Pest Management Objectives
Students will:
0212.4.1 Explain and apply the concepts of integrated pest management.
0212.4.2 Identify safety guidelines for tools, equipment and pesticide use.

0212.4.3 Identify pests and evaluate control methods according to label interpretation.
0212.4.4 Recognize, calibrate and operate pesticide application equipment.
0212.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
0212.4.6 Demonstrate knowledge of and interpret federal and state pesticide laws.

Standard 5: Selected Specialty Areas in Horticulture (0212.S.5)
Students will identify the various specialty areas in horticulture.

Specialty Areas in Horticulture Objectives
Students will:
0212.5.1 Explore professions in floriculture and understand the scope of job opportunities.
0212.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.
0212.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.
0212.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.
0212.5.5 Explore professions in nursery production and understand job requirements.
0212.5.6 Demonstrate techniques and procedures used in the nursery production industry.
0212.5.7 Research careers in the landscape and turf industry.
0212.5.8 Perform basic landscape design, plantings and maintenance techniques.
0212.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Laboratory Investigation (0212.S.6)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0212.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0212.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0212.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0212.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Technology Applications (0212.S.7)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:
0212.7.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in horticulture.
- Locate, evaluate, and collect information from a variety of sources related to horticulture.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0212.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
0212.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.
0212.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Process/Workplace Skills (0212.S.8)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0212.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
0212.8.2 Explore careers available in horticulture.
0212.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.
0212.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
0212.8.5 Demonstrate correct language usage in all oral and written work.
0212.8.6 Perform effectively in both leadership and non-leadership roles.
0212.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
0212.8.8 Participate as a team member to complete a variety of assignments.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Leadership and Communication Development (0213.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Communication Development Objectives
Students will:
0213.1.1 Describe FFA and its components.
0213.1.2 Utilize record-keeping skills in work-based experience programs (SAE).
0213.1.3 Identify appropriate career opportunities in the floriculture industry.
0213.1.4 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
0213.1.5 Develop personal relation and communication skills.
0213.1.6 Demonstrate an awareness of employment and floriculture industry ethics.

Standard 2: Principles of Design (0213.S.2)
Students will utilize principles of design to critique floral designs.

Principles of Design Objectives
Students will:
0213.2.1 Utilize floriculture principles, elements and theory of design.
0213.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
0213.2.3 Understand the concepts and use of color.

Standard 3: Cut Flowers and Greens (0213.S.3)
Students will identify and maintain commonly used cut flowers and foliage.

Cut Flowers and Greens Objectives
Students will:
0213.3.1 Identify and classify flowers and foliage.
0213.3.2 Understand the techniques to maintain optimum flower and foliage quality.

Standard 4: Floral Materials and Supplies (0213.S.4)
Students will identify and manipulate materials and supplies used in floral design.

Floral Materials and Supplies Objectives
Students will:
0213.4.1 Identify the basic mechanics and supplies used in floral design.
0213.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
0213.4.3 Demonstrate construction of bows.

Standard 5: Selected Specialty Areas (0213.S.5)
Students will design the appropriate product according to the occasion.

Selected Specialty Areas Objectives
Students will:
0213.5.1 Design boutonnieres and corsages.
0213.5.2 Understand concepts in floral design of holiday arrangements.
0213.5.3 Identify designs for weddings and receptions.
0213.5.4 Recognize practice in sympathy floral designs.
0213.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.

0213.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Floral Operations and Management (0213.S.6)
Students will develop strategies and understand the components used in floral operations and management.

Floral Operations and Management Objectives
Students will:
0213.6.1 Develop skills in retail sales using various selling techniques.
0213.6.2 Develop a visual merchandising plan to project the right image.
0213.6.3 Identify the components and the importance of a floral delivery system.
0213.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts provide students with individual goals and objectives including: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Leadership Development (0214.S.1)
Students will participate in various FFA activities.

Leadership Development Objectives
Students will:
0214.1.1 Demonstrate an awareness of FFA and its components.
0214.1.2 Utilize record-keeping skills in work-based experience programs.
0214.1.3 Develop and exhibit communication skills.
0214.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
0214.1.5 Demonstrate personal and social skills.
0214.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Greenhouse Structure, Operation and Maintenance (0214.S.2)
Students will identify different greenhouse structures, operations and maintenance.

Greenhouse Structure, Operation and Maintenance Objectives
Students will:
0214.2.1 Identify different greenhouse parts and compare types of structures and coverings.
0214.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
0214.2.3 Diagram operational systems in the greenhouse operation.
0214.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Plant Classification and Identification (0214.S.3)
Students will identify the different plant classification.

Plant Classification and Identification Objectives
Students will:
0214.3.1 Demonstrate an understanding of the natural classification system for the plant kingdom.
0214.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Environmental Control and Plant Growth (0214.S.4)
Students will identify the different environmental elements and plant growth.

Environmental Control and Plant Growth Objectives
Students will:
0214.4.1 Describe the plant processes involved with plant growth and development.
0214.4.2 List plant growth regulators and document their effects on plants.
0214.4.3 Explain how essential elements become available for plant use.
0214.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Greenhouse Media and Containers (0214.S.5)
Students will identify the greenhouse media effects and the different types of containers.

Greenhouse Media and Containers Objectives
Students will:
0214.5.1 Research the components of media and amendments.
0214.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
0214.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Plant Processes and Propagation (0214.S.6)
Students will identify the levels of plants processes and propagation.

Plant Processes and Propagation Objectives
Students will:
0214.6.1 Perform methods of propagating plants.
0214.6.2 Manipulate total environment from juvenile to mature plant.
0214.6.3 Demonstrate knowledge of plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identifying and Controlling Disease, Insects, and Weeds (0214.S.7)
Students will identify and control disease, insects and weeds with proper pesticide usage.

Disease, Insects, and Weeds Objectives
Students will:
0214.7.1 Identify and exhibit guidelines for pesticide use.
0214.7.2 Practice integrated pest management procedures.
0214.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Greenhouse Business Management (0214.S.8)
Students will identify the various types of managing a greenhouse business.

Greenhouse Business Management Objectives
Students will:
0214.8.1 Explore and discuss the various types of records kept in a greenhouse business.
0214.8.2 Use computers to solve problems related to greenhouse management.
0214.8.3 Describe the methods and determine the values and limitations of effective advertising.
0214.8.4 Develop a plan for profitable sales techniques.
0214.8.5 Record receipts and expenditures.

Standard 9: Laboratory Investigation (0214.S.9)
Students will safely conduct laboratory investigations and exploratory learning.

Laboratory Investigation Objectives
Students will:
0214.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
0214.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
0214.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
0214.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Technology Applications (0214.S.10)
Students will apply technology to investigate real-world problems.

Technology Applications Objectives
Students will:

0214.10.1 Use computers and the World Wide Web (WWW) to:
- Solve problems related to work-based experience programs in greenhouse technology.
- Locate, evaluate, and collect information from a variety of sources related to greenhouse technology.
- Develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

0214.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

0214.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.

0214.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Process/Workplace Skills (0214.S.11)
Students will demonstrate personal and group workplace skills.

Process/Workplace Skills Objectives
Students will:

0214.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

0214.11.2 Explore careers available in greenhouse technology.

0214.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

0214.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

0214.11.5 Demonstrate correct language usage in all oral and written work.

0214.11.6 Perform effectively in both leadership and non-leadership roles.

0214.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

0214.11.8 Participate as a team member to complete a variety of assignments.

Landscape Design And Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, the students will implement the plan.

Standard 1: Leadership and Interpersonal Skill Development (0215.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0215.1.1 Participate in FFA activities.
0215.1.2 Write, deliver and evaluate a speech and/or presentation.
0215.1.3 Explore careers in the landscape industry.
0215.1.4 Determine appropriate job seeking and keeping skills.
0215.1.5 Describe ethical conduct.
0215.1.6 Utilize record-keeping skills in work-based experience programs (SAE).

Standard 2: Basic Landscape Design (0215.S.2)
Students will recognize and demonstrate basic principles of planning and implementing the landscape design.

Basic Landscape Design Objectives
Students will:
0215.2.1 Determine environmental requirements for landscape plant materials.
0215.2.2 Recognize the appropriate plants for landscape use.
0215.2.3 Interpret landscape symbols for a landscape plan.
0215.2.4 Operate computer assisted design programs.
0215.2.5 Demonstrate knowledge of drafting skills needed in a landscape plan.

Standard 3: Safe Use and Operation of Horticulture Tools and Equipment. (0215.S.3)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0215.3.1 Identify and properly use horticulture tools and equipment.
0215.3.2 Follow appropriate safety procedures and policies.
0215.3.3 Interpret and follow safety information from equipment manuals.
0215.3.4 Maintain and adjust safety devices.
0215.3.5 Service tools and equipment as to manufactures specifications.
0215.3.6 Operate equipment under job site conditions.

Standard 4: Implementation of the Landscape Design (0215.S.4)
Students will apply principles of landscape design.

Landscape Design Objectives
Students will:
0215.4.1 Prepare an area to be landscaped.
0215.4.2 Construct walkways and landscape structures.
0215.4.3 Install balled and burlapped, containerized and bare root plantings.
0215.4.4 Install herbaceous landscape plants.
0215.4.5 Place edging materials.
0215.4.6 Mulch a landscape site.
0215.4.7 Install turf areas.
0215.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. The students will understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Leadership and Interpersonal Skill Development (0216.S.1)
Students will demonstrate leadership skills through personal, organizational, and workplace experiences.

Leadership and Interpersonal Skill Development Objectives
Students will:
0216.1.1 Participate in FFA activities and programs.
0216.1.2 Identify communication skills.
0216.1.3 Identify interview and employment readiness skills.
0216.1.4 Draft a resume.

Standard 2: Demonstrate Safe Use and Operation of Horticulture Tools and Equipment (0216.S.2)
Students will practice and demonstrate safety with landscape tools, equipment and activities.

Horticulture Tools and Equipment Objectives
Students will:
0216.2.1 Identify and properly use horticulture tools and equipment.
0216.2.2 Follow appropriate safety procedures and policies.
0216.2.3 Interpret and follow safety information from equipment manuals.
0216.2.4 Maintain and adjust safety devices.
0216.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
0216.2.6 Operate equipment under job site conditions.
0216.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Using Pest Management Techniques (0216.S.3)
Students will describe safe pesticide use and the concept of integrated pest management.

Pest Management Techniques Objectives
Students will:
0216.3.1 Identify, calibrate, and properly use equipment.
0216.3.2 Identify and use personal safety equipment and protective clothing.
0216.3.3 Identify pests and the appropriate control techniques.
0216.3.4 Introduce Integrated Pest Management (IPM) techniques.
0216.3.5 Interpret pesticide labels and proper use as instructed.
0216.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Demonstrate Proper Landscape Maintenance Techniques (0216.S.4)
Students will maintain the landscape.

Landscape Maintenance Objectives
Students will:
0216.4.1 Determine and follow appropriate lawn care practices.
0216.4.2 Aerate and dethatch turf areas.
0216.4.3 Determine and implement irrigation needs for turf and landscaped areas.
0216.4.4 Identify appropriate soil testing procedures.
0216.4.5 Over-seed, lime, and fertilize as deemed necessary.
0216.4.6 Determine and implement proper pruning timelines and practices.

0216.4.7 Maintain landscape edging materials.
0216.4.8 Mulch landscape planting.
0216.4.9 Maintain landscape structures.
0216.4.10 Describe appropriate winter protection.
0216.4.11 Utilize record-keeping skills in work-based experience programs (SAE).

Business Law

This course focuses on the impact of law as it relates to business and individuals. Students will examine criminal and civil law with a concentration on consumer, contract, property, and employment laws while assessing ethics as they relate to each.

Standard 1: Ethics (1417.S.1)
Examine ethics related to business law.

Relationship of Ethics to Business Law Objectives
Students will:

1417.1.1 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship, and justice.
1417.1.2 Distinguish the various ways in which ethical decisions can be made.
1417.1.3 Describe why laws are needed.
1417.1.4 Explain the relationship between law and ethics and why they sometimes conflict.
1417.1.5 Compare and contrast the five major sources of today's law. (Federal and state constitutions, English common law, statutes, court decisions, and administrative law).

Standard 2: Criminal, Civil and Business Law (1417.S.2)
Identify the elements of criminal, civil and business law including trial procedures.

Elements of Criminal and Civic Law Objectives
Students will:

1417.2.1 Describe and define different types of crimes.
1417.2.2 Determine defenses to criminal acts.
1417.2.3 Distinguish between a tort and a crime.
1417.2.4 Differentiate between and give examples of negligence and intentional torts.
1417.2.5 Explain the concepts of the reasonable person test and proximate cause.
1417.2.6 Explain the concept of strict/absolute liability.
1417.2.7 Enumerate the steps in a civil and a criminal trial.
1417.2.8 Describe crimes affecting business.
1417.2.9 Explain civil rights when being accused of a crime.
1417.2.10 Distinguish between different types of courts.
1417.2.11 Explain duties of jurors and witnesses.

Standard 3: Contracts (1417.S.3)
Analyze contracts.

Contract Objectives
Students will:

1417.3.1 Identify the elements of a contract (offer, acceptance, genuine agreement, consideration, capacity, and legality).
1417.3.2 Discuss the requirements of an offer and acceptance and how the offer can be terminated/discharged.
1417.3.3 Explain a minor's right to avoid a contract and identify people who lack contractual capacity.
1417.3.4 List the essential information that should be included in writing under the statute of frauds.
1417.3.5 Explain the parole evidence rule.
1417.3.6 Describe breach of contract and the remedies available when a contract is breached.

Business Computer Literacy

This area of study is designed as a one semester course to reinforce proper keyboarding techniques, develop basic computer concepts and terminology skills, develop an understanding of ethical computer practices, explore the diverse educational uses of the Internet and introduce the use of (document) word processing, database, and/or spreadsheet computer applications.

Standard 1: Proper Keyboarding Techniques (1415.S.1)
Demonstrate proper keyboarding techniques on the computer.

Proper Keyboarding Technique Objectives
Students will:
1415.1.1 Demonstrate proper keyboarding techniques using the touch system.
1415.1.2 Develop skill on the keyboard using quick key commands found in application software.

Standard 2: Computer Careers, Uses, and Ethics (1415.S.2)
Identify computer careers, computer uses, and computer ethics.

Computer Careers, Uses, and Ethics Objectives
Students will:
1415.2.1 Identify careers found in the computer industry.
1415.2.2 Distinguish among the uses of computers for industry, business, and personal use including the benefits found in navigating the Internet.
1415.2.3 Demonstrate ethical procedures for the operation and management of a computer.
1415.2.4 Explain the impact of computers on society.
1415.2.5 Explain the computer's capabilities and limitations.

Standard 3: Basic Terminology and Concepts (1415.S.3)
Communicate basic computer terminology and concepts.

Basic Terminology and Concepts Objectives
Students will:
1415.3.1 Describe and identify computer hardware components by name.
1415.3.2 Define differences in word processing, database, and spreadsheet applications.
1415.3.3 Name commonly used programming languages and identify user groups of each.
1415.3.4 Explain the types of computers and examples for each.
1415.3.5 Communicate with others using computer vocabulary.

Standard 4: Hardware/Software Proficiency for Copy Production (1415.S.4)
Achieve basic proficiency in operating the computer in order to produce final copy and demonstrate correct usage of the hardware and software.

Basic Proficiency Operation Objectives (Hardware, Software, and Final Copy Production)
Students will:
1415.4.1 Define steps for the information processing cycle; input, processing output, storage.
1415.4.2 Explain procedures for handling different forms of media for saving and retrieving information.
1415.4.3 Demonstrate turning on and shutting down the computer properly and uses of the warm boot and cold boot commands.
1415.4.4 Distinguish between major operating systems currently on the market.
1415.4.5 Use the computer as a tool to perform simple information processing applications appropriate to the student's level and background.

Business Computer Applications II

This area of study is designed to develop entry-level skills appropriate to an area of specialization in information systems. Students will achieve proficiency in the use of software packages in the areas of database, word processing, spreadsheets and presentation/desktop publishing.

Standard 1: Computer Applications Concepts and Resources (1413.S.1)
Review computer application concepts and resources common to the work environment.

Common Applications Objectives
Students will:

1413.1.1 Demonstrate proper keyboarding techniques.
1413.1.2 Identify and demonstrate components and the proper care of hardware and software.
1413.1.3 Select appropriate application software.
1413.1.4 Explain the various types of operating systems.
1413.1.5 Be familiar with a variety of reference materials (such as manuals, on-line help, vendor bulletin boards, etc.) for finding solutions and learning software programs.
1413.1.6 Be familiar with periodicals dealing with emerging state-of-the-art computer hardware and software.
1413.1.7 Demonstrate ability in using a computer operating system.

Standard 2: Proficiency in Computer Applications (1413.S.2)
Achieve proficiency utilizing computer applications.

Application Objectives
Students will:

1413.2.1 Transfer text, images and data between software programs.
1413.2.2 Develop advanced computer skills with specific software applications.
1413.2.3 Identify communications software for specific tasks/hardware.
1413.2.4 Identify and demonstrate accessing, navigating and using on-line services.
1413.2.5 Send and receive electronic mail (e-mail and faxes).
1413.2.6 Compose, manipulate, proofread, edit and print word processing documents.
1413.2.7 Plan, create, store, query, retrieve, sort, update, add and delete records using database software.
1413.2.8 Plan, create, store, manipulate, retrieve, sort, update, and, search, sort, delete, chart and print data using spreadsheet software.
1413.2.9 Create, format, import data, scanned images and graphics to produce presentations of desktop publishing products.
1413.2.10 Prepare multimedia presentations by creating, designing, importing (data, graphics, scanned images, sound and video), formatting and editing.

Business Computer Applications I

This area of study is designed to provide the learner with the opportunity to understand and apply integrated software to business applications. The students will achieve basic proficiency in word processing, spreadsheet, desktop publishing, computerized presentations, Internet and/or database applications.

Standard 1: System Careers and Ethical Issues (1411.S.1)
Identify information system careers and ethical issues.

Careers and Ethical Issues of Information Systems Careers Objectives
Students will:

1411.1.1 Research educational requirements and skill experience for careers in information systems.
1411.1.2 Research how changing technology affects working environments and life styles.
1411.1.3 Demonstrate ethical procedures in the management of information systems.

Standard 2: Computer Hardware/Software Identification (1411.S.2)
Identify computer hardware and software.

Computer Hardware/Software Identification Objectives
Students will:

1411.2.1 Describe hardware components of a computer system.
1411.2.2 Demonstrate proper handling and care of software and hardware.
1411.2.3 Differentiate between system software and application software.
1411.2.4 Identify the difference between hardware and software.
1411.2.5 Develop an understanding of the concept of integrated software.
1411.2.6 Specify the difference between stand-alone computers and networked systems.

Standard 3: Utilizing Integrated Software Applications (1411.S.3)
Develop skills needed to apply integrated software applications to business procedures.

Applying Integrated Software Applications to Business Procedures Objectives
Students will:

1411.3.1 Demonstrate proper keyboarding techniques.
1411.3.2 Develop proper usage of word processing, database, and/or spreadsheet software terminology.
1411.3.3 Apply integrated software to perform input, processing, output and revision of various business documents.
1411.3.4 Employ the word processing function of an integrated package to complete a document requiring the use of commands to create, format, edit, save and print.
1411.3.5 Utilize the spreadsheet function of an integrated package to perform mathematical and logical operations and/or use the database function of an integrated package for file and database management (sort, combine and merge, etc.).
1411.3.6 Demonstrate proper use of multimedia software.
1411.3.7 Investigate Internet usage and electronic mail.
1411.3.8 Prioritize and complete assigned tasks using integrated software.
1411.3.9 Proofread and revise assigned projects to produce correct final output.
1411.3.10 Develop office scheduling and organizing skills (calendars, appointments and addresses).

1409.6.6 List and discuss qualities that employers expect in potential employees.
1409.6.7 Use correct strategies for accepting or rejecting an employment offer.
1409.6.8 Discuss alternative sources for job searches.
1409.6.9 Discuss appropriate oral and written steps in leaving a job (resignation, downsizing, exit interview).
1409.6.10 Discuss potential problems with signing employment contract and effective salary negotiation strategies.

1409.3.2 Identify and overcome major barriers to listening.
1409.3.3 Discuss the value of silence in communication as a nonverbal cue.
1409.3.4 Direct courteous attention to and synthesize information from multiple speakers within a group to obtain key facts and respond in an effective manner.
1409.3.5 Give examples of how nonverbal messages have different meanings in various cultures.
1409.3.6 Demonstrate a command of interactive listening techniques.
1409.3.7 Receive, interpret, and respond to verbal messages and other cues, such as body language, in ways that are appropriate.
1409.3.8 Demonstrate the ability to follow through on oral instructions in completing jobs.

Standard 4: Reading Strategies (1409.S.4)
Demonstrate use of reading strategies.

Reading Strategies Objectives
Students will:
1409.4.1 Distinguish between fact and opinion in written materials and electronic media (e.g., Internet).
1409.4.2 Analyze the integrity of printed or oral information.
1409.4.3 Explain career-specific terminology.
1409.4.4 Interpret business correspondence, professional articles, and supporting graphic material.
1409.4.5 Interpret information from manuals, computer printouts, and other electronic sources.
1409.4.6 Select an appropriate reading method for a particular situation (e.g., skimming, scanning, speed reading, and in-depth reading).
1409.4.7 Identify and discuss the intent of printed propaganda and its impact on decision-making.

Standard 5: Basic Social Communication Skills (1409.S.5)
Apply basic social communication skills in personal and professional situations that prepare a student to be adaptable in a global business environment.

Basic Social Communication Objectives
Students will:
1409.5.1 Analyze personal self-concept and design a program for improvement.
1409.5.2 Explain the role that self-concept plays in one=s personal and professional life.
1409.5.3 Select appropriate business attire and demonstrate good grooming and personal hygiene.
1409.5.4 Display a positive attitude in personal and professional settings.
1409.5.5 Understand and develop an appropriate work ethic.
1409.5.6 Apply team skills in a business environment.
1409.5.7 Apply the principles of group dynamics in structured activities.
1409.5.8 Demonstrate appropriate responses to passive, assertive, and aggressive behavior.
1409.5.9 Select appropriate communication techniques to avoid, minimize, or prevent conflicts.
1409.5.10 Respect the customer-client confidentiality.

Standard 6: Communications in a Career (1409.S.6)
Integrate all forms of communication in the successful pursuit of a career.

Career Communication Objectives
Students will:
1409.6.1 Complete systematic career and job analysis.
1409.6.2 Compose formal letters of application, create an appropriate resume, complete application forms, and compose follow-up letters for job opportunities.
1409.6.3 Participate in and analyze mock interviews in various situations.
1409.6.4 Discuss and demonstrate the importance of appropriate dress in an interview situation.
1409.6.5 Discuss the significance of nonverbal communications in the interviewing process.

Business Communication

This area of study will focus on the application of communication skills through a variety of informal and formal experiences. The performance-based course will emphasize effective interpersonal and team building skills. Technology will be used to create and deliver presentations, to enhance problem-solving situations, and to practice critical thinking and decision-making. Job interview, research paper, or a senior project will culminate this course. ***Strongly Recommended: At least a AC@ average in English courses previously completed.***

Standard 1: Oral Communications (1409.S.1)
Communicate orally in a clear, courteous, concise, and responsible manner on personal and professional levels.

Oral Communication Objectives
Students will:

1409.1.1 Use standard oral English usage.
1409.1.2 Organize thoughts to reflect logical, positive, and tactful thinking before speaking.
1409.1.3 Participate in group discussion and role playing for problem solving.
1409.1.4 Ask/Answer impromptu questions with confidence to elicit information in the exchange of ideas in a formal/informal setting (e.g., interview or formal classroom discussion).
1409.1.5 Discuss and demonstrate steps in creating and using proper techniques in making a formal oral presentation.
1409.1.6 Use proper telephone techniques and etiquette to gather and record information.
1409.1.7 Demonstrate an awareness and acceptance of international, regional, and multicultural speech.

Standard 2: Composing Correspondence (1409.S.2)
Compose correspondence that uses Standard English usage, acceptable format, and proper mechanics.

Composing Correspondence Objectives
Students will:

1409.2.1 Compose a variety of business letters, memorandums, reports, and electronic messages using correct style, format, and content that promotes a positive response utilizing the "You" approach to business writing.
1409.2.2 Use acceptable steps in the writing process.
1409.2.3 Identify factors affecting the readability for specific audiences.
1409.2.4 Proofread business documents to ensure that they are clear, correct, concise, complete, consistent, and courteous.
1409.2.5 Avoid use of language bias (e.g., gender, religion, physically challenged, or race, etc.).
1409.2.6 Use a variety of references, resources, and graphics (both electronic and printed) for the purpose of writing business documents.
1409.2.7 Analyze and respond in writing to routine business problems both individually and collaboratively.

Standard 3: Listening and Observation Skills (1409.S.3)
Use active listening and observation skills to understand the positions of others, and use verbal and nonverbal cues from others to communicate effectively in return.

Active Listening and Observations Using Verbal/Nonverbal Objectives
Students will:

1409.3.1 Listen objectively, assess, and respond/record major points of a speaker's message including nonverbal messages.

Standard 4: Basic Computer Skills (1407.S.4)
Demonstrate basic computer skills.

Basic Computer Skill Objectives
Students will:
1407.4.1 Identify hardware components.
1407.4.2 Demonstrate the proper care and use of hardware and software.
1407.4.3 Demonstrate proficiency in using operating system commands.
1407.4.4 Demonstrate the functions and common features of word processing software.
1407.4.5 Use document processing terminology.

Standard 5: Investigate careers. (1407.S.5)
Investigate careers utilizing keyboarding skills.

Investigate Careers Objective
Students will:
1407.5.1 Integrate the relevance of keyboarding skills to all occupational areas.

Basic Keyboarding

This area of study is designed as a one-semester course to provide learners with keyboarding skills required for success in academic and occupational areas. Concepts in this area include keyboard operation, formatting skills, computer skills, appropriate work habits, and career awareness.

Standard 1: Work Habits (1407.S.1)
Exhibit good work habits.

Work Habits Objectives
Students will:

1407.1.1 Follow oral and written instructions in the completion of assigned tasks and work efficiently to meet deadlines.
1407.1.2 Exhibit the attitudes and work habits necessary for good interpersonal and employee/ employer relations in the workforce.
1407.1.3 Keep the area in and around the workstation organized by properly assembling supplies and information necessary to complete assigned tasks.
1407.1.4 Illustrate desirable work ethics.

Standard 2: Keyboarding Operational Skills (1407.S.2)
Demonstrate proper keyboard operation skills.

Proper Keyboarding Skills Objectives
Students will:

1407.2.2 Apply information processing concepts.
1407.2.3 Correctly manipulate document formatting tools.
1407.2.4 Master operation of the alphabet, punctuation, number, and symbol keys by touch.
1407.2.5 Exhibit proofreading skills by visually checking for errors utilizing the manual method or computer proofreading tools (i.e., spell check, grammar check, thesaurus.)
1407.2.6 Increase keyboarding speed and accuracy.

Standard 3: Basic Production Skills (1407.S.3)
Apply basic production skills.

Basic Production Skill Objectives
Students will:

1407.3.1 Develop language arts skills through composition at the keyboard utilizing capitalization, punctuation, and word division rules, number usage and spelling.
1407.3.2 Using correct grammar, key simple business/personal communications in error free form.
1407.3.3 Demonstrate basic production and editing skills in keyboarding and formatting copy for short reports, simple tables, memorandums, personal/business communications from arranged, rough-draft, handwritten, incomplete or unedited copy.
1407.3.4 Illustrate basic formatting skills on enumeration and outlines.
1407.3.5 Identify and correctly use proofreader's marks.
1407.3.6 Apply horizontal and vertical centering to text.
1407.3.7 Maintain a minimum speed of 40 words per minute with no more than three errors on a three-minute timed writing.
1407.3.8 Prepare envelopes using USPS style and insert correctly folded letters.
1407.3.9 Practice problem solving and decision-making skills.

Standard 5: Federal Reserve System (1405.S.5)
Analyze the Federal Reserve System and monetary policy.

Federal Reserve System Objectives
Students will:

1405.5.1 Define Federal Reserve System
1405.5.2 Describe the responsibilities of the Federal Reserve System
1405.5.3 Define monetary policy
1405.5.4 Locate the Federal Reserve banks and branches on a US map
1405.5.5 Differentiate between the U.S. Mint and the U.S. Bureau of Engraving
1405.5.6 Explain banks use of magnetic ink character recognition and electronic funds transfer

Banking and Finance

This course will help maximize a student's earning potential, develop strategies for managing financial resources, and gain insight into different methods of investing.

Standard 1: Careers in Banking and Finance (1405.S.1)
Explain banking and finance traits.

Banking and Finance Career Objectives
Students will:
1405.1.1 Use appropriate terminology
1405.1.2 Maintain ethical character traits, such as honesty, integrity, compassion, respect, responsibility citizenship and justice.

Standard 2: Budgets (1405.S.2)
Identify the need for and develop a budget.

Budgeting Objectives
Students will:
1405.2.1 Compare and contrast lifestyles and effects on a budget
1405.2.2 Identify steps in planning a budget
1405.2.3 Develop a budget based on goals, income, expenses, and savings
1405.2.4 Enumerate problems incurred without a budget

Standard 3: Saving and Investing (1405.S.3)
Differentiate between saving and investing.

Saving and Investing Objectives
Students will:
1405.3.1 Enumerate reasons for saving
1405.3.2 Describe differences between saving and investing
1405.3.4 List guidelines for investing
1405.3.5 Identify common choices for investing
1405.3.6 Explain uses of technology in the investment industry
1405.3.7 Determine opportune times for investing
1405.3.8 Interpret stock quotations
1405.3.9 Complete mock stock purchases
1405.3.10 Compute net gain/loss

Standard 4: Banking (1405.S.4)
Explain functions of banks and regulations of the banking industry.

Banking Objectives
Students will:
1405.4.1 Describe functions and characteristics of money
1405.4.2 Identify the source of value to the US Dollar and its area of storage
1405.4.3 Explain main functions of banks
1405.4.4 Identify government regulations of the banking industry
1405.4.5 Compute simple & compound interest
1405.4.6 Explain importance of maintaining confidentiality
1405.4.7 Write checks, maintain a checkbook balance, and compute a bank reconciliation statement

Standard 3: Specialized Accounting Procedures (1403.S.3)
Utilize specialized accounting procedures and applications.

Specialized Accounting Procedures Objectives
Students will:

1403.3.1 Implement procedures for departmental or branch accounting systems.
1403.3.2 Analyze and implement various methods for budgetary planning and control.
1403.3.3 Analyze and implement cost accounting procedures for manufacturing accounting.
1403.3.4 Analyze financial statements for a manufacturing concern to make cost decisions.
1403.3.5 Examine accounting issues faced by different types of industries such as services, manufacturing, and distribution.
1403.3.6 Analyze income statements and balance sheets for a business.
1403.3.7 Differentiate between the three basic types of businesses (services, merchandising and manufacturing).
1403.3.8 Interpret the differences between sole proprietorships, partnerships, and corporations
1403.3.9 Understand the accounting principles for not-for-profit and government entities.
1403.3.10 Demonstrate an understanding between personal and business taxation at various levels.

Accounting Principles II

This course provides students the opportunity to develop advanced knowledge of accounting procedures and techniques utilized in problem solving and in making financial decisions and analysis. Students study the advanced principles, concepts and practices of the accounting cycle that includes financial statements, banking, payroll, partnerships, corporation, cost accounting, inventory, and tax accounting.

Standard 1: Accounting Procedures (1403.S.1)
Demonstrate accounting procedures.

Accounting Procedures Objectives
Students will:

1403.1.1 Use accounting terminology.
1403.1.2 Understand and maintain ethical standards in the preparation of financial statements.
1403.1.3 Interpret characteristics of professional conduct.
1403.1.4 Use specialized accounting software, or spreadsheets, to maintain accounting procedures.
1403.1.5 Demonstrate competence in the structure and sequence of the accounting cycle utilizing manual and automated systems.
1403.1.6 Analyze computer generated reports.

Standard 2: Accounting Procedures for Assets, Liabilities, and Equity (1403.S.2)
Implement accounting procedures for assets, liabilities, and equity.

Assets, Liabilities, and Equity Procedures Objectives
Students will:

1403.2.1 Analyze cash and accounts receivable transactions and record in appropriate journals.
1403.2.2 Analyze investment transactions and record in appropriate journals.
1403.2.3 Calculate inventories using various methods and record in appropriate journals.
1403.2.4 Analyze plant and intangible asset transactions and record in appropriate journals.
1403.2.4 Analyze current liabilities transactions and record in appropriate journals.
1403.2.5 Analyze long-term liabilities transactions and record in appropriate journals.
1403.2.6 Analyze equity transactions for various forms of business ownership and record in appropriate journals.
1403.2.7 Generate financial and end-of-period statements.
1403.2.8 Analyze and interpret financial statements.
1403.2.9 Update accounts through adjusting and closing entries.
1403.2.10 Explain and record adjusting and reversing entries for accrued revenue and expenses.
1403.2.11 Complete account procedures for prepaid expenses and unearned revenue.
1403.2.12 Analyze, compute and record transactions related to uncollectible accounts.
1403.2.13 Manage the computations and recordings of transactions related to notes receivable and notes payable.
1403.2.14 Identify concepts and practices related to accounting for plant assets.
1403.2.15 Calculate and record depreciation of plant assets.
1403.2.16 Analyze the concept of cash flow management.

1401.4.3 Compute gross earnings, deductions and net pay for an employee.
1401.4.4 Record and post transactions associated with payroll activities.
1401.4.5 Create and maintain employee earnings records.
1401.4.6 Demonstrate generation of payroll checks.
1401.4.7 Demonstrate the ability to write business checks and complete check stubs and check registers.
1401.4.8 Demonstrate the ability to prepare bank deposits slips.
1401.4.9 Identify and demonstrate the three types of check endorsements.
1401.4.10 Reconcile a bank statement, prepare journal entries, and post.
1401.4.11 Demonstrate an understanding for replenishing of and preparing journal entries for the petty cash fund.

Accounting Principles I

This course prepares students with the basic principles of the accounting cycle. Students study the basic principles, concepts and practices of the accounting cycle which includes financial statements, banking, payroll, business ownerships and an accounting career orientation.

Standard 1: Accounting Careers (1401.S.1)
Investigate accounting as a career.

Career Objectives
Students will:
1401.1.1 Define the purpose of accounting and the role it plays in our economy.
1401.1.2 Use appropriate accounting terminology.
1401.1.3 Discuss entry-level accounting positions and their education requirements.
1401.1.4 Identify confidentiality concepts and policies.
1401.1.5 Identify characteristics of professional and ethical conduct.

Standard 2: Accounting Cycle (1401.S.2)
Analyze accounting procedures, as applied to the accounting cycle.

Procedures Objectives
Students will:
1401.2.1 Demonstrate the effects of transactions on the accounting equation.
1401.2.2 Identify and use source documents.
1401.2.3 Prepare a chart of accounts using proper numerical sequencing.
1401.2.4 Demonstrate the purpose of a general journal and how it relates to a ledger.
1401.2.5 Post general journal entries to the general ledger and update the account balances.
1401.2.6 Prepare a trial balance.
1401.2.7 Prepare/create financial statements.
1401.2.8 Calculate and record end-of-period adjustments.
1401.2.9 Prepare post-closing trial balance.
1401.2.10 Use specialized accounting software, or spreadsheets, to maintain accounting records.
1401.2.11 Identify the differences between computerized and manual accounting procedures.

Standard 3: The Accounting Cycle for Specialized Procedures (1401.S.3)
Students will implement specialized accounting procedures as applied to the accounting cycle.

The Accounting Cycle Objectives
Students will:
1401.3.1 Differentiate between the different types of business ownerships.
1401.3.2 Differentiate between a service and a merchandising business.
1401.3.3. Analyze transactions relating to the purchase of merchandise and record in special journals.
1401.3.4 Analyze transactions relating to sale of merchandise and record in special journals.
1401.3.5 Analyze financial statements.

Standard 4: Payroll and Banking Procedures (1401.S.4)
Analyze payroll and banking procedures.

Payroll and Banking Procedures Objectives
Students will:
1401.4.1 Define methods used to determine gross earnings.
1401.4.2 Explain the purpose of deductions and withholdings.

0217.4.5 Describe the use of biological controls in integrated pest management.
0217.4.6 Calculate pesticide application rates.
0217.4.7 Describe safe chemical handling and safety equipment.
0217.4.8 Identify controls for large pests.

Standard 5: Equipment and Safety (0217.S.5)
Students will practice and demonstrate safety with turf tools, equipment, and activities.

Equipment and Safety Objectives
Students will:
0217.5.1 Identify principles of equipment and personal safety.
0217.5.2 Demonstrate ability to operate turf equipment.
0217.5.3 Explain basic equipment maintenance.
0217.5.4 Identify correct mower sharpening procedures.

Standard 6: Developing Work-Based Experiential Program (SAE) (0217.S.6)
Students will explore careers and plan a SAE.

SAE Objectives
Students will:
0217.6.1 Explore opportunities for Supervised Agricultural Experience Programs.
0217.6.2 Establish a Supervised Agricultural Experience Program in grounds maintenance.
0217.6.3 Maintain records of experience program activities, expenses and earnings.

Turf Management

This area of study is designed to provide students with scientific concepts and skills necessary to properly analyze problems in the turf management industry. Major concepts include pest management, cultural practices and scientific methods of evaluating turf problems.

Standard 1: Leadership and Communication Development (0217.S.1)
Students will demonstrate leadership skills through personal, organizational and workplace activities.

Leadership and Communication Development Objectives
Students will:
0217.1.1 Describe FFA.
0217.1.2 Identify appropriate career opportunities in the turfgrass industry.
0217.1.3 Prepare a resume', complete a job application, and demonstrate job seek/keep skills.
0217.1.4 Develop personal relations communication skills.
0217.1.5 Identify career opportunities in turf management.
0217.1.6 Identify income potential in turf management.

Standard 2: Growth and Physiology (0217.S.2)
Students will describe the process of plant growth.

Growth and Physiology Objectives
Students will:
0217.2.1 Identify major plant parts.
0217.2.2 Identify adaptation zones.
0217.2.3 Identify warm and cool season species of turfgrass.
0217.2.4 Identify turf growth patterns.

Standard 3: Cultural Practices (0217.S.3)
Students will demonstrate practices pertaining to the establishment and maintenance of turfgrass.

Cultural Practices Objectives
Students will:
0217.3.1 Identify appropriate mowing techniques for given areas.
0217.3.2 Describe the 1/3 rule.
0217.3.3 Explain soil-sampling procedures.
0217.3.4 Identify soil testing techniques and procedures.
0217.3.5 Calculate fertilizer application rates.
0217.3.6 Explain fertilizer application techniques.
0217.3.7 Explain the two major irrigation techniques.
0217.3.8 Calculate irrigation rates.
0217.3.9 Identify verticutting, rolling, top dressing and aeration.
0217.3.10 Explain turf establishment procedures.

Standard 4: Pest Management (0217.S.4)
Students will demonstrate safe pesticide use and describe the concept of integrated pest management.

Pest Management Objectives
Students will:
0217.4.1 Identify common turf insects.
0217.4.2 Identify common turf weeds.
0217.4.3 Identify common turf diseases.
0217.4.4 Identify control practices for pests.

Standard 4: Consumer Law (1417.S.4)
Analyze consumer law.

Consumer Law Objectives
Students will:

1417.4.1 Identify legislation that regulates consumer credit, such as Fair Credit Reporting Act, Fair Credit Billing Act, Equal Credit Opportunity Act, Fair Credit Collection Practices Act, Consumer Credit Protection Act and E-Commerce.
1417.4.2 Discuss consumer protection legislation, such as the Federal Trade Commission Act, the Consumer Product Safety Act, and the Consumer Leasing Act.
1417.4.3 Explain the importance of the Uniform Commercial Code (UCC) as it relates to the consumer.
1417.4.4 Identify various types of warranties and describe how each of the warranties may be excluded or modified.
1417.4.5 Describe and discuss the various aspects of bankruptcy, such as Liquidation, Reorganization, and Reorganization of Debts.

Standard 5: Real and Personal Property (1417.S.5)
Explain legal rules that apply to real and personal property.

Real and Personal Property Objectives
Students will:

1417.5.1 Distinguish among liens, licenses, and easements and explain the differences.
1417.5.2 List the major estates in land and describe the major features of each.
1417.5.3 List and describe the forms of co-ownership of real property.
1417.5.4 Illustrate the methods of transferring title (deeding) to real and personal property.
1417.5.5 Describe the kinds of rental relationships that landlords and tenants may create.
1417.5.6 Recognize the advantages and disadvantages of financing/leasing a car.
1417.5.7 Describe the principal kinds of automobile insurance.
1417.5.8 Name and describe the principal types of bailments.
1417.5.9 Contrast the rights and duties in bailments.
1417.5.10 Compare the law of patents, copyrights, and trademarks.

Standard 6: Employment Law (1417.S.6)
Analyze employment law.

Employment Law Objectives
Students will:

1417.6.1 Describe the employer-employee relationship and the rights and duties of each.
1417.6.2 Explain the doctrine of employment-at-will and describe the wrongful discharge exceptions to employment-at-will.
1417.6.3 Describe the collective bargaining process and other union activities.
1417.6.4 List and explain major legislation affecting the employer-employee relationship.
1417.6.5 Explain the relationship of Title VII of the Civil Rights Act to employment.

Standard 7: Personal Law (1417.S.7)
Analyze legal rules that apply to domestic situations.

Personal Law Objectives
Students will:

1417.7.1 Understand the rights and responsibilities of minors.
1417.7.2 Explain the relationship between school and minors.
1417.7.3 Explain marriage contracts.
1417.7.4 Distinguish between legal rights and obligations of marriage

1417.7.5 Describe the legal aspects of parenthood.
1417.7.6 Discuss considerations for termination of a marriage.
1417.7.7 Understand the legal ramifications of death.

Business Math

Business math prepares students for using mathematical skills as related to business.

Standard 1: Computation Skills (1419.S.1)
Develop computational skills needed to solve business and consumer problems.

Computation Skills Objectives (Business Problems and Consumer Problems)
Students will:

1419.1.1 Solve problems that involve whole numbers, decimals, and fractions.
1419.1.2 Solve problems that involve percents, ratios, and proportions.
1419.1.3 Interpret tables, charts, and graphs.

Standard 2: Analyze and Solve Business Problems (1419.S.2)
Analyze and solve business problems for such areas as payroll records, taxation, personal cash management, credit management, depreciation, inventory records, purchases, sales, and financial statements.

Analyze and Solve a variety of Business Problems Objectives
Students will:

1419.2.1 Calculate earnings using different wage plans.
1419.2.2 Determine payroll deductions and compute net pay.
1419.2.3 Complete a signature card, deposit slip, maintain checkbook and prepare reconciliation statement.
1419.2.4 Identify the types of savings and checking accounts currently available.
1419.2.5 Identify and state how certified checks and cashier's checks are used.
1419.2.6 List the types of endorsements and state when to use them.
1419.2.7 Prepare a budget for personal money management.
1419.2.8 Compute individual income taxes.
1419.2.9 Identify an installment contract and a promissory note and calculate interest and maturity value.
1419.2.10 Determine the balance due for installment purchases.
1419.2.11 Determine finance/additional charges, periodic payment, total cost, and the Annual Percentage Rate (APR) on an installment contract.
1419.2.12 Identify purchase cost, salvage value, useful life, depreciation base, and book value.
1419.2.13 Compute depreciation by the following methods: straight-line, sum-of-the-years-digits, declining balance, and unit-of-production.
1419.2.14 Compute a physical inventory value by using FIFO, LIFO, specific identification and average cost methods.
1419.2.15 Compute the net profit or loss.
1419.2.16 Determine the dollar amount of cost, markup, or sales price when one of the three variables is unknown.
1419.2.17 Determine the dollar amount of markdowns, regular selling price, or reduced price when one of the three variables is unknown.
1419.2.18 Complete a sales invoice with sales information and sales tax.
1419.2.19 Identify each element of the fundamental accounting equation. (Assets = Liabilities + Owner's Equity)
1419.2.20 State and describe the debit and credit theory.
1419.2.21 Interpret a balance sheet and income statement.
1419.2.22 Distribute partnership income (revenue) or loss by different methods.
1419.2.23 Calculate commissions.
1419.2.24 Calculate insurance premiums.
1419.2.25 Examine differences between term and whole life insurance policies.

Business Recordkeeping

This course prepares the student with entry level skills which enable them to process business forms and financial records.

Standard 1: Careers in Personal Recordkeeping (1421.S.1)
Analyze personal recordkeeping as a career.

Personal Recordkeeping Career Objectives
Students will:
1421.1.1 Define the purpose of personal record keeping and the role it plays in our economy.
1421.1.2 Use appropriate personal record keeping terminology.
1421.1.3 Research entry-level personal record keeping positions and their educational requirements.
1421.1.4 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship and justice.

Standard 2: Personal Recordkeeping Practices (1421.S.2)
Demonstrate personal recordkeeping practices.

Personal Recordkeeping Practices Objectives
Students will:
1421.2.1 Enter and correct data on business forms.
1421.2.2 Verify data processing computer output.
1421.2.3 Demonstrate a numeric filing system.
1421.2.4 Demonstrate an alphabetic filing system.
1421.2.5 Identify the differences between computerized and manual data processing procedures.
1421.2.6 Compare and demonstrate the differences between personal, family, and business budgets.
1421.2.7 Identify the purposes and procedures in handling credit/loan functions.

Standard 3: Monetary Funds (1421.S.3)
Demonstrate the handling of monetary funds.

Handling Monetary Funds Objectives
Students will:
1421.3.1 Prepare a proof of cash.
1421.3.2 Demonstrate how to give correct change.
1421.3.3 Demonstrate the ability to properly record cash receipt transactions.

Standard 4: Banking Procedures (1421.S.4)
Develop banking procedures.

Banking Procedures Objectives
Students will:
1421.4.1 Demonstrate the ability to write business checks and complete check stubs and check registers.
1421.4.2 Demonstrate the ability to prepare bank deposits slips.
1421.4.3 Identify and demonstrate the three types of check endorsements.
1421.4.4 Prepare a bank reconciliation statement.

Standard 5: Petty Cash Records (1421.S.5)
Prepare petty cash records.

Petty Cash Objectives
Students will:
1421.5.1 Prepare a petty cash voucher and attach receipts.
1421.5.2 Record in the petty cash book business expenses, cash shortages and overages, and replenishment of the petty cash fund.

Standard 6: Payroll Procedures (1421.S.6)
Demonstrate payroll procedures.

Payroll Procedures Objectives
Students will:
1421.6.1 Demonstrate procedures used to determine gross earnings.
1421.6.2 Compute gross earnings, deductions, and net pay for an employee and record them on the payroll register.
1421.6.3 Record payroll information into individual earning records.
1421.6.4 Prepare tax and payroll deduction forms.

Standard 7: Daily Business Forms (1421.S.7)
Prepare and use daily business forms.

Daily Business Forms Objectives
Students will:
1421.7.1 Prepare sales slips.
1421.7.2 Prepare statements of account.
1421.7.3 Prepare purchase requisitions.
1421.7.4 Prepare purchase orders.
1421.7.5 Prepare invoices.

Standard 8: Accounting Forms (1421.S.8)
Prepare and use accounting forms.

Basic Accounting Forms Objectives
Students will:
1421.8.1 Prepare a purchase journal.
1421.8.2 Prepare accounts payable and accounts receivable ledgers.
1421.8.3 Prepare a cash payments journal.
1421.8.4 Prepare a cash receipts journal.
1421.8.5 Prepare a general journal.

Computerized Presentations

This area of study is designed to develop intermediate/advanced-level skills utilizing presentation software. Students will achieve proficiency and expert level skills and will have the opportunity to receive specialized certification by taking an examination. This is a one-semester course.

Standard 1: Presentation Development (1423.S.1)
Create a presentation.

Presentation Development Objectives
Students will:
1423.1.1 Create from a template.
1423.1.2 Create from an existing presentation.
1423.1.3 Delete slides.

Standard 2: Textual (1423.S.2)
Add textual information to presentations.

Textual Objectives
Students will:
1423.2.1 Enter text in a slide and outline view.
1423.2.2 Enter bulleted information.
1423.2.3 Change the text alignment.

Standard 3: Visual Elements (1423.S.3)
Add visual elements to presentations.

Visual Element Objectives
Students will:
1423.3.1 Add formatting.
1423.3.2 Build a graph.
1423.3.3 Draw an object.
1423.3.4 Rotate and fill an object.
1423.3.5 Scale and size an object.
1423.3.6 Add a table.
1423.3.7 Add shapes.
1423.3.8 Animate objects.
1423.3.9 Add transitions.
1423.3.10 Add an organization chart.
1423.3.11 Set custom options.
1423.3.12 Check styles.

Standard 4: Customizing Presentations (1423.S.4)
Customize presentations by bringing in data from other resources.

Customize Presentation Objectives
Students will:
1423.4.1 Add clip art.
1423.4.2 Insert an Excel chart.
1423.4.3 Import text from Word.
1423.4.4 Add scanned images.
1423.4.5 Add sound and movie.
1423.4.6 Export an outline to Word.

Standard 5: Modifying Presentations (1423.S.5)
Modify a presentation.

Modifying Presentation Objectives
Students will:
1423.5.1 Change the sequence of a slide.
1423.5.2 Find and replace text.
1423.5.3 Modify the slide master.
1423.5.4 Modify sequence in outline mode.
1423.5.5 Change tabs.
1423.5.6 Change fonts.
1423.5.7 Change the alignment of text.

Standard 6: Distribution (1423.S.6)
Prepare for distribution.

Distribution Objectives
Students will:
1423.6.1 Use spelling and grammar check.
1423.6.2 Add speaker notes.
1423.6.3 Set automatic slide timing.

Standard 7: Enhancing Presentations (1423.S.7)
Customize a presentation.

Enhancing Presentation Objectives
Students will:
1423.7.1 Create a custom background.
1423.7.2 Customize a color scheme.
1423.7.3 Customize clip art and other objects.
1423.7.4 Recolor and edit objects.
1423.7.5 Apply a template from another presentation.
1423.7.6 Add links to other slides within the presentation.
1423.7.8 Hide slides.

Standard 8: Presentation Delivery (1423.S.8)
Deliver presentations.

Presentation Delivery Objectives
Students will:
1423.8.1 Start a slide show on any slide.
1423.8.2 Use on screen navigation tools.
1423.8.3 Generate meeting notes
1423.8.4 Electronically incorporate meeting features.
1423.8.5 Print slides in a variety of formats.
1423.8.6 Print color presentations.
1423.8.7 Export to overhead.
1423.8.8 Export to 35mm slides.
1423.8.9 Present with presentation conferencing.
1423.8.10 Save presentation for use on another computer.
1423.8.11 Save for Internet use.

Cooperative Office Education

Cooperative Office Education is an on-the-job training for students that contributes to the over-all instructional program. The instruction, through written agreement between school and employers, is a combination of study in school with employment in the appropriate field. The related classroom instruction and on-the-job experiences are planned and supervised by employers and teacher coordinators to complete the student's education as to his/her career objective.

Standard 1: Human Relations Skills (1425.S.1)
Demonstrate human relations skills required for success in the workplace.

Human Relations Skills Objectives
Students will:
1425.1.1 Demonstrate honesty and integrity.
1425.1.2 Use proper business ethics in all business activities.
1425.1.3 Demonstrate respect for customers, co-workers, and management.
1425.1.4 Demonstrate initiative in completing job duties.
1425.1.5 Maintain a positive attitude and positive relationship with customers, co-workers, and management.
1425.1.6 Adapt to changes in job responsibilities.
1425.1.7 Appreciate diversity in the workplace.
1425.1.8 Exhibit self-control when working with customers, co-workers and management.
1425.1.9 Use appropriate assertiveness.
1425.1.10 Exhibit empathy for customers, co-workers and management.
1425.1.11 Use feedback from others for personal growth.
1425.1.12 Practice proper business etiquette.
1425.1.13 Identify procedures to respond to sexual harassment.

Standard 2: Business Communications (1425.S.2)
Demonstrate appropriate business communication skills.

Communications Objectives
Students will:
1425.2.1 Use correct grammar and vocabulary in written and oral communications.
1425.2.2 Listen to and follow directions.
1425.2.3 Explain policies and procedures to customers and clients.
1425.2.4 Perform proper telephone techniques appropriately.
1425.2.5 Demonstrate the proper procedure for job termination.

Standard 3: Basic Work Skills (1425.S.3)
Demonstrate mastery of basic work skills for a chosen occupation.

Basic Work Skills Objectives
Students will:
1425.3.1 Maintain punctuality, appropriate attendance, and dependability.
1425.3.2 Work independently without direct supervision.
1425.3.3 Stay with an assigned task until successful completion.
1425.3.4 Utilize time management principles when completing assignments.
1425.3.5 Apply organizational skills in daily activities.
1425.3.6 Participate as a team member when completing a work project.
1425.3.7 Produce quality work.
1425.3.8 Accept accountability for one=s performance.

1425.3.9 Perform basic mathematical functions.
1425.3.10 Operate the most common electronic equipment with speed and accuracy.
1425.3.11 Maintain appropriate records for use on the job and in class.
1425.3.12 Demonstrate leadership skills when completing a project or task.
1425.3.13 Exhibit decision-making skills.
1425.3.14 Solve problems individually and as a team member.
1425.3.15 Participate in company meetings and activities.

Standard 4: Basic Safety Techniques (1425.S.4)
Apply and demonstrate basic safety techniques.

Basic Safety Techniques Objectives
Students will:
1425.4.1 Practice basic safety rules.
1425.4.2 Handle company equipment properly and safely.
1425.4.3 Demonstrate safety procedures for handling and lifting heavy materials.
1425.4.4 Follow procedures in the case of an accident, including reporting procedures.
1425.4.5 Follow security procedures.
1425.4.6 Practice proper safety procedures for handling and storing hazardous materials.
1425.4.7 Recognize and report hazardous conditions.
1425.4.8 Read and interpret operating instructions before using equipment.
1425.4.9 Explain and practice procedures for safe evacuation.
1425.4.10 Identify A, B, and C fires and how to extinguish them.
1425.4.11 Identify proper agencies for safety procedures (fire department, police department, OSHA, hospital).

Database Management

This area of study is designed to develop skills in database application software. Students will achieve proficiency and expert level skills and will have the opportunity to receive a specialized certification. (One semester class)

Standard 1: Create Databases (1427.S.1)
Create databases.

Create Database Objectives
Students will:
1427.1.1 Plan a database.
1427.1.2 Create a table.
1427.1.3 Enter data into a table.
1427.1.4 Modify data in a table.
1427.1.5 Enter data into a form.
1427.1.6 Navigate through a table.
1427.1.7 Delete data from a table.

Standard 2: Forms (1427.S.2)
Create and utilize forms.

Create Form Objectives
Students will:
1427.2.1 Create a simple form.
1427.2.2 Modify a form.
1427.2.3 Create controls on a form.
1427.2.4 Modify controls.
1427.2.5 Add a record using a form.
1427.2.6 Show related records on a form.

Standard 3: Modify databases (1427.S.3)
Modify pre-created databases.

Database Modification Objectives
Students will:
1427.3.1 Open a database.
1427.3.2 Modify field properties.
1427.3.3 Modify field layout.
1427.3.4 Modify the presentation of a database.

Standard 4: View Information (1427.S.4)
Utilize view techniques.

View Information Objectives
Students will:
1427.4.1 Present information in chart.
1427.4.2 View information in a form.
1427.4.3 View multiple records.
1427.4.2 Switch between views.

Standard 5: Organize Information (1427.S.5)
Organize data information in single and multiple fields

Organize Data Fields Objectives
Students will:
1427.5.1 Sort data on single fields.
1427.5.2 Sort data on multiple fields.

Standard 6: Locate Information (1427.S.6)
Locate records and work with queries.

Record and Query Objectives
Students will:
1427.6.1 Find a specific record.
1427.6.2 Create a simple query.
1427.6.3 Create a query with multiple criteria.
1427.6.4 Add filters (selection and form).
1427.6.5 Remove filters.

Standard 7: Refine Results of a Query (1427.S.7)
Refine query results by adding, removing, sorting, joining and removing tables.

Refine Query Objectives
Students will:
1427.7.1 Add fields to a query.
1427.7.2 Remove fields from a query.
1427.7.3 Sort a query.
1427.7.4 Join tables in a query.
1427.7.5 Remove joins in a query.
1427.7.6 Save a query.

Standard 8: Analyze Data (1427.S.8)
Analyze data.

Analyze Data Objectives
Students will:
1427.8.1 Build summary queries.
1427.8.2 Calculate fields.
1427.8.3 Set crosstab queries.

Standard 9: Create Sub Forms (1427.S.9)
Create sub forms by adding records and merging tables.

Create Sub Form Objectives
Students will:
1427.9.1 Identify appropriate use for sub forms.
1427.9.2 Add a record with a main form.
1427.9.3 Add records with sub forms.
1427.9.4 Merge two tables into a form.

Standard 10: Building a Relational Database (1427.S.10)
Build relational databases.

Relational Database Objectives
Students will:
1427.10.1 Identify relationships.

1427.10.2 Relate tables.

Standard 11: Integrate Applications (1427.S.11)
Integrate information from other applications.

Application Integration Objectives
Students will:
1427.11.1 Import data.
1427.11.2 Link data.
1427.11.3 Add pictures to records.

Standard 12: Utilize Web Capability (1427.S.12)
Utilize the web for hyperlinks and building forms.

Web Capability Objectives
Students will:
1427.12.1 Create hyperlinks.
1427.12.2 Build order forms for Internet use.

Standard 13: Maintain Data Integrity (1427.S.13)
Maintain data integrity.

Data Integrity Objectives
Students will:
1427.13.1 Identify criteria for data integrity.
1427.13.2 Validate text.
1427.13.3 Set required properties.
1427.13.4 Set validation rules.
1427.13.5 Set look up fields.
1427.13.6 Use expressions in calculated controls.

Standard 14: Build Forms for Other Users (1427.S.14)
Create and modify forms.

Building Form Objectives
Students will:
1427.14.1 Title a form.
1427.14.2 Modify form design.
1427.14.3 Improve accuracy in a form.
1427.14.4 Enhance design of a form.

Standard 15: Produce Reports (1427.S.15)
Create, label, modify, and manipulate data in reports.

Producing Reports Objectives
Students will:
1427.15.1 Create a report.
1427.15.2 Modify a report.
1427.15.3 Label a report.
1427.15.4 Customize headers and footers.
1427.15.5 Make a calculation on a report.
1427.15.6 Group data in a report.
1427.15.7 Sort data in a report.
1427.15.8 Add custom pages.

Standard 16: Print. (1427.S.16)
Print forms, queries and reports.

Print Objectives
Students will:
1427.16.1 Print a report.
1427.16.2 Print a form.
1427.16.3 Print the result of a query.

Desktop Publishing

This course will introduce students to a variety of ways that people use tools and resources to communicate. Students will explore various applications in desktop publishing through hands-on activities and experiences which may include brochures, pamphlets, newsletters, letterheads, tables (graphs, charts, etc.), memo forms, advertisements, banners, business cards, web pages, etc.

Standard 1: Basic Desktop Publishing Concepts (1429.S.1)
Identify desktop publishing concepts.

Basic Desktop Publishing Concepts Objectives
Students will:

1429.1.1 Define and use desktop publishing terminology.
1429.1.2 Identify desktop publishing concepts, i.e. audience appeal, design, layout, and marketing.
1429.1.3 Review and practice basic word processing skills, i.e. mouse, opening, editing, formatting, saving, printing.
1429.1.4 Identify and analyze desktop publishing career opportunities.

Standard 2: Desktop Software (1429.S.2)
Demonstrate skills utilizing desktop software.

Utilizing Desktop Software Objectives
Students will:

1429.2.1 Define publication software, start the program, view the publication software window, open and save a publication, enter text in a frame, view and print a publication and exit the program.
1429.2.2 Plan and design a publication, create a publication with the Wizard, replace frame text, import a graphic and text, import an object from a drawing program (Paintbrush), add a sidebar, add a pull quote, use the Wizard tools, and group/ ungroup objects.
1429.2.3 Use layout guides, use ruler guides, work with a frame, add bullets and numbering, check spelling, use graphics (clip art folder), paint formats, and add a table.
1429.2.4 Insert and resize clip art, copy and move an object, crop an image, align and group images, layer objects, rotate art, use drawing tools, and fill drawn shapes.
1429.2.5 Define styles, modify and apply a style, change a format into a style, create columns, adjust text overflows, add >Continued on/from= notices, add drop caps, and create reversed text.
1429.2.6 Add a page, delete a page, work with a background, create a header and footer, add page numbers, work with stories, use tabs, and create a booklet.
1429.2.7 Add border art, create an object shadow, design word art, create a bleed, create a watermark, wrap text around a frame, rotate a text frame, create a Web page.
1429.2.8 Use a digital camera and a scanner to import visuals into publications.

Standard 3: Legal and Ethical (1429.S.3)
Determine legal and ethical aspects of desktop publishing.

Legal and Ethical Objectives
Students will:

1429.3.1 Identify copyright and patent laws pertaining to scanned images and documents, electronic clip art, scanned photography, trademarks, and information (graphics and text) downloaded from the Internet.
1429.3.2 Identify licensing agreements associated with desktop publishing software.

Digital Imaging/Mutimedia

This course will introduce students to the basics of producing digital images for multimedia purposes. Students will explore various methods of producing images through hands-on activities and experiences which will include: operating a digital camera and a scanner, using imaging software to improve photos or to create special effects, creating simple animations, manipulating video images, and producing multimedia images.

Standard 1: Basic Computer Concepts (1431.S.1)
Identify basic computer concepts

Basic Computer Concepts Objectives
Students will:
1431.1.1 Define and use digital imaging terminology
1431.1.2 Explore careers requiring digital imaging skills
1431.1.3 Explore basic concept of Web navigation

Standard 2: Digital Cameras
Operate digital cameras

Digital Cameras Operation Objectives
Students will:
1431.2.1 Identify features of different types of digital cameras
1431.2.2 Take pictures and transfer images to the computer using different types of digital cameras
1431.2.3 Manipulate and organize images transferred from digital cameras

Standard 3: Operate Scanner
Operate scanners.

Scanner Operations Objectives
Students will:
1431.3.1 Identify different types of scanners and scanning software programs
1431.3.2 Scan images using different types of scanners and software programs
1431.3.3 Transfer images to computer software.

Standard 4: Utilizing Imaging Software
Utilize imaging software.

Imaging Software Objectives
Students will:
1431.4.1 Identify different types of imaging software
1431.4.2 Identify different types of file formats
1431.4.3 Produce digital photographs
1431.4.4 Understand layers and create photos using layers
1431.4.5 Incorporate color techniques and enhance images
1431.4.6 Add type to an image
1431.4.7 Create special effects with filters
1431.4.8 Create multimedia photos

Standard 5: Create Animations (1431.S.5)
Create animations.

Create Animations Objectives
Students will:
1431.5.1 Identify animation software
1431.5.2 Place images to create animations
1431.5.3 Create frames from images to animate
1431.5.4 Enhance animations
1431.5.5 Create multimedia animations

Standard 6: Digital Video Images (1431.6)
Create and manipulate digital video images.

Digital Video Images Objectives
Students will:
1431.6.1 Identify features and operate video digital camera
1431.6.2 Use digital video software to cut, edit, apply effects and transitions to video clips
1431.6.3 Create multimedia video clips

Standard 7: Computer Generated Drawings (1431.S.7)
Create computer generated drawings.

Computer Created Generated Drawings Objectives
Students will:
1431.7.1 Identify different types of computer drawing software
1431.7.2 Identify and use major components of a drawing program
1431.7.3 Create graphics for multimedia uses; such as buttons and banners for Web pages, letterheads, business cards, flyers

Standard 8: Legal and Ethical Imaging (1431.S.8)
Analyze legal and ethical aspects of creating digital images.

Legal and Ethical Aspects of Creating Digital Images Objectives
Students will:
1431.8.1 Identify and understand the concepts of plagiarism and copyright violations
1431.8.2 Discuss ethical and unethical behavior when producing digital images
1431.8.3 Discuss laws related to production and distribution of digital images
1431.8.4 Identify the legal issues related to the production and distribution of digital images

Document (Word) Processing

This course will provide students the opportunity to obtain life-long document processing skills through hands-on learning situations utilizing a variety of software functions. Classroom experiences also provide for skill development in visual and oral communication.

Standard 1: Basic Concepts and Office Operations (1433.S.1)
Acquire basic concepts and office operations procedures.

Basic Concepts and Office Procedural Operations Objectives
Students will:

1433.1.1 Load, access and exit operating system and software.
1433.1.2 Use file and disk management procedures such as deleting, copying, backing up files, and formatting disks.
1433.1.3 Develop work habits for maintenance of storage media and computer hardware.
1433.1.4 Define and use document (word) processing terminology.
1433.1.5 Demonstrate the utilization of different word processing software packages.
1433.1.6 Perform skills for each phase of the word processing cycle.
1433.1.7 Identify document processing supply needs.
1433.1.8 Use a software manual as a reference for finding solutions and learning software packages.
1433.1.9 Develop work habits and attitudes that will enhance future career endeavors.

Standard 2: Document Production (1433.S.2)
Produce error-free documents utilizing a variety of hardware and software.

Error-free Documents Utilizing a Variety of Hardware and Software Objective
Students will:

1433.2.1 Create documents representing a variety of formats such as letters, reports, tables and memos.
1433.2.2 Proofread (manually and electronically) complex business documents.
1433.2.3 Insert, delete, move, and copy text and data.
1433.2.4 Customize word processing software defaults.
1433.2.5 Troubleshoot a word processing problem by obtaining assistance from help screens and printed manuals.
1433.2.6 Create and execute macros.
1433.2.7 Sort data in ascending and descending order.
1433.2.8 Create and merge a primary file with a secondary file.
1433.2.9 Utilize on-screen forms and templates.
1433.2.10 Integrate spreadsheet, database, and word processing applications in documents.
1433.2.11 Use transfer skills to understand and compare different word processing software.
1433.2.12 Use rough draft handwritten sources to input material.
1433.2.13 Practice decision-making skills for document processing procedures and priorities.
1433.2.14 Compose and produce error-free documents.
1433.2.15 Recognize and use proofreader's marks.

Standard 3: Electronic Communications (1433.S.3)
Develop the skills necessary to communicate electronically.

Electronic Communications Objectives
Students will:

1433.3.1 Access data from news groups, home pages, and other online resources
1433.3.2 Upload and download electronic data.

1433.3.3 Identify emerging trends in document processing.

Standard 4: Career Employment Skills (1433.S.4)
Develop skills relating to career employment.

Career Employment Skills Objectives
Students will:
1433.4.1 Explore career options.
1433.4.2 Compose a letter of application.
1433.4.3 Create or update a resume.
1433.4.4 Compose an interview follow-up letter.

Economics of Business

This course focuses on the impact of economics as it relates to businesses and individuals. Because businesses are part of the overall economy, the success of any individual business is strongly affected by events in the economy as a whole. In addition, the economy as a whole is affected by the actions of the individual members within it.

Standard 1: Economic Principles (1435.S.1)
Describe the importance of economic principles in today's society.

Economic Principles in Today's Society Objectives
Students will:
1435.1.1 Identify opportunity costs and trade-offs involved in making choices about how to use scarce economic resources.
1435.1.2 Give examples of economic wants and needs.
1435.1.3 Identify the resources (factors of production) that are used to satisfy wants and needs.
1435.1.4 Define economic goods and services.
1435.1.5 Explain how the concept of scarcity affects the availability of economic goods and services.

Standard 2: Productivity, Specialization and Division of Labor Change (1435.S.2)
Explain the importance of productivity and discuss how specialization and division of labor change productivity.

Productivity, Specialization and Division of Labor Change Objectives
Students will:
1435.2.1 Analyze the methods of increasing productivity.
1435.2.2 Demonstrate specialization and division of labor.
1435.2.3 Explain how the relationship of input to output affects the level of productivity.

Standard 3: Basic Economic Systems Differences (1435.S.3)
Explain why societies develop economic systems and identify the basic features of different economic systems.

Basic Economic Systems Differences Objectives
Students will:
1435.3.1 Explain why a society needs an economic system.
1435.3.2 Discuss advantages and disadvantages of different types of economic systems.
1435.3.3 Discuss how an economic system addresses the questions what is to be produced, how it is to be produced, and for whom.

Standard 4: Role of Core U.S. Economic Institutions and Incentives (1435.S.4)
Explain the role of core economic institutions and incentives in the U.S. economy.

Core U.S. Economic Institutions and Incentives Objectives
Students will:
1435.4.1 Describe the concept of profit in the free enterprise system.
1435.4.2 Provide examples of economic institutions and incentives.
1435.4.3 Analyze reasons why a society's allocation of resources will be affected by its laws, public policy, and taxation.

Standard 5: Role of Exchange and Money (1435.S.5)
Explain the role of exchange and money in an economic system and describe the effect of interdependence on economic activity.

Role of Exchange and Money Objectives
Students will:
1435.5.1 Demonstrate the concept of barter.
1435.5.2 Explain why and illustrate how money can contribute to an increased number of exchanges, greater specialization and interdependence, and a higher standard of living in an economy.

Standard 6: Role of Supply and Demand as related to Markets and Prices in the U.S (1435.S.6)
Describe the role of law of supply and demand in the U.S. economy.

Role of Markets and Prices In the U.S. Economy Objectives
Students will:
1435.6.1 Define the concept of supply and demand.
1435.6.2 Analyze prices as determined by supply and demand.
1435.6.3 Identify determinants of supply and demand for goods and services.
1435.6.4 Describe how relative prices affect buying and selling decisions of producers and consumers.
1435.6.5 Graph the concept of price on a supply and demand curve.

Standard 7: Types of Competitive Structures and Markets (1435.S.7)
Describe different types of competitive structures and illustrate the role of competitive markets in the U.S. and other economies.

Types of Competitive Structures and Markets Objectives
Students will:
1435.7.1 Explain how competition among sellers affects prices and profits.
1435.7.2 Determine the role of government in preventing private monopolies and regulating public monopolies.
1435.7.3 Research U.S. laws and government regulations that are designed to maintain competition.
1435.7.4 Compare and contrast price and non-price competition.

Standard 8: Personal Financial Resources and Consumer Decisions (1435.S.8)
Manage limited personal financial resources and recognize that more of the wants and needs of members of a society can be satisfied if wise consumer decisions are made.

Personal Financial Resources and Consumer Decisions Objectives
Students will:
1435.8.1 Analyze the consumer decision making process for products and explain why there is variance in price for a given item bought from different suppliers.
1435.8.2 Use published consumer resources to collect information for making buying decisions.
1435.8.3 Identify sources and types of credit.
1435.8.4 Calculate the cost of credit.
1435.8.5 Develop a plan to allocate financial resources to meet an individual's financial goals.
1435.8.6 Describe the advantages and disadvantages of different saving and investing plans.
1435.8.7 Identify services that financial institutions provide to customers.
1435.8.8 Perform the steps involved in opening and using a checking account.
1435.8.9 Reconcile a bank statement.

Standard 9: U.S. Economy Functions and Measures (1435.S.9)
Explain how the U.S. economy functions as a whole and describe economic measures of economic activity such as gross domestic product, unemployment and inflation.

U.S. Economy Functions and Measures of Activities Objectives
Students will:
1435.9.1 Explain the Consumer Price Index.
1435.9.2 Analyze the factors that affect Gross Domestic Product.

Standard 10: Role of Government in an Economic System (1435.S.10)
Discuss the role of government in an economic system, especially the necessary and desirable role of government in the U.S. economy.

Role of Government in an Economic System Objectives
Students will:
1435.10.1 Explain how government taxation affects consumers and producers.
1435.10.2 Define and give examples of progressive, regressive, and proportional taxes.
1435.10.3 Analyze the effect of national debt on the level of economic activity.

Standard 11: U.S. Economy Citizens Rights and Responsibilities (1435.S.11)
Describe rights and responsibilities of citizens in the U.S. economy.

U.S. Economy Citizens Rights and Responsibilities Objectives
Students will:
1435.11.1 Identify consumer rights.
1435.11.2 Describe how legislation defines and protects consumer rights.
1435.11.3 Examine how society's needs are balanced against the individual's rights and responsibilities.
1435.11.4 Explain how consumer legislation affects product.
1435.11.5 Distinguish between fraudulent, misleading, and legitimate product claims.

Standard 12: Economic Relationships Among Nations (1435.S.12)
Examine the importance of economic relationships among nations and discuss the role of international trade and investment and international monetary relations in the global economy.

Economic Relationships Among Nations Objectives
Students will:
1435.12.1 Explain the importance of imports and exports in a global economy.
1435.12.2 Identify examples of goods and services that imported and exported.
1435.12.3 Explain foreign exchange rates and why the value of currency changes.
1435.12.4 Explain the advantages and disadvantages of free trade agreements between and among nations.

International Business and Marketing

This course is for students with a career interest in the field of international trade or for students who intend to pursue a business/marketing degree. This course provides students with an understanding of the various careers in international trade, finance and marketing. Fundamental concepts, principles, and theories of marketing in an international setting are considered.

Standard 1: Role of International Business (1437.S.1)
Explain the Role of International Business.

Role of International Business Objectives
Students will:

1437.1.1 Identify examples of international trade in the local and state community.
1437.1.2 Describe the impact of international business activities on the local, regional and national levels.
1437.1.3 Analyze the impact of a domestic company involving itself in international trade opportunities.
1437.1.4 Describe the resources (e.g., ports, trade routes, transportation centers, foreign trade zones and natural, financial, and human resources) of major cities around the world.
1437.1.5 Identify business opportunities in countries in various levels of economic development.

Standard 2: Communication Strategies (1437.S.2)
Apply Communication Strategies in International Business Relations.

Communication Strategies Objectives
Students will:

1437.2.1 Compose effective business communications.
1437.2.2 Analyze international business blunders resulting from ineffective or incorrect communication patterns.
1437.2.3 Identify international cultural differences in food, dress, social behaviors and language.
1437.2.4 Compare business protocol of various countries.
1437.2.5 State examples of non-verbal communication affecting international businesses.

Standard 3: Social, Cultural, Political, Legal, and Economic Factors (1437.S.3)
Describe Factors That Shape and Impact the International Business Environment.

Social, Cultural, Political, Legal and Economic Factors that Impact the International Business Environment Objectives
Students will:

1437.3.1 Identify distinctive social and cultural factors affecting business activities (e.g. time, workday, workweek, schedules, holidays).
1437.3.2 Describe how trade barriers, tariffs, quotas and taxation policies affect choice of location for companies operating internationally.
1437.3.3 Recognize legal differences that exist between and among countries in areas such as consumer protection, product guidelines, labor laws, contract formulation, liability and taxation.
1437.3.4 Define terms such as GDP (GNP), balance of trade, foreign debt and cost of living.
1437.3.5 Analyze the availability of resources and economic potential in various countries.
1437.3.6 Identify the economic systems used to decide what to produce, how it is produced, and for whom it is produced in a country.
1437.3.7 Evaluate the competitive strengths and weaknesses faced by a company involved in international business.

Standard 4: International Finance and Risk Management (1437.S.4)
Explain the Role, Importance, and Concepts of International Finance and Risk Management.

International Finance and Risk Management Objectives
Students will:
1437.4.1 Explain how currency exchange rates affect companies.
1437.4.2 Identify risks associated with international trade.

Standard 5: Operations and Management of Human Resources (1437.S.5)
Address the Operations and Management of Human Resources.

Operations and Management of Human Resources Objectives
Students will:
1437.5.1 Describe the production processes used to create goods and services in different countries.
1437.5.2 Discuss factors that influence the type of merchandise/inventory control systems used by companies operating internationally.
1437.5.3 Identify the factors that influence the application of managerial styles in different countries.
1437.5.4 Describe how compensation and employee benefits differ in various cultures.
1437.5.5 Identify how differences in occupational health and safety standards impact the conduct of business internationally.

Standard 6: Marketing Concepts (1437.S.6)
Apply Marketing Concepts to International Business.

Marketing Concepts Objectives
Students will:
1437.6.1 Describe how a company markets a product/service in other countries.
1437.6.2 Illustrate how social, cultural, technological and geographic factors influence consumer buying behavior in different countries.
1437.6.3 Evaluate market potential for a good or service in a foreign market.
1437.6.4 Describe how the marketing mix elements need to be adapted for international marketing efforts.
1437.6.5 Analyze buying patterns of consumers in a foreign market.
1437.6.6 Explain how the marketing research process, including data collection, differs in an international application.
1437.6.7 Give examples of countries that have absolute and comparative advantage.
1437.6.8 Explain how brands and packages are affected by culture.
1437.6.9 Explain how the business environment affects prices charged in foreign markets.
1437.6.10 Select distribution channels for a company involved in international business.
1437.6.11 Discuss media used in different foreign markets.
1437.6.12 Analyze the influence of social and cultural factors affecting promotions used in foreign markets.

Standard 7: Trade Concepts in the Import/Export Process (1437.S.7)
Relate Balance of Trade Concepts to the Import/Export Process.

Trade Concepts Objectives
Students will:
1437.7.1 Identify goods and services imported to or exported from a country.
1437.7.2 Analyze the import or export potential for a good or service.
1437.7.3 Describe the role that U.S. Customs and the customs agencies of other countries play in international trade activities.
1437.7.4 Define why trade barriers are imposed by governments (such as quotas, tariffs, licensing

requirements, exchange rate controls).

1437.7.5 Describe international trade agreements (e.g., GATT, NAFTA).

Standard 8: Business Ownership and Entrepreneurial Opportunities (1437.S.8)

Identify Forms of Business Ownership and Entrepreneurial Opportunities.

Forms of Business Ownership and Entrepreneurial Opportunities Objectives

Students will:

1437.8.1 Analyze various forms of business ownership (e.g., sole proprietorship, corporation, partnership) for different international business situations.

1437.8.2 Determine social and cultural influences on the form of business ownership used or required in different countries.

1437.8.3 Identify potential new international business ventures for locally based companies.

1437.8.4 Distinguish between licensing and franchising for international business activities.

Standard 9: Technology in International Business. (1437.S.9)

Identify Technology Utilized in International Business.

Technology in International Business Objectives

Students will:

1437.9.1 Describe how the use of technology impacts the global market.

1437.9.2 Identify global e-commerce legal issues.

Introduction to Business and Marketing

This course is an introduction course that explores careers in business and marketing, the role of marketing in today's business world and a broad overview of economics.

Standard 1: Careers in Business and Marketing (1439.S.1)
Explore Careers in Business and Marketing.

Careers Objectives
Students will:
1439.1.1 Research and present information regarding careers in business and marketing.
1439.1.2 Explain how economic trends affect employment in business and marketing careers.
1439.1.3 Complete an interest survey to determine potential career options.

Standard 2: Private Enterprise System (1439.S.2)
Define and Explain How the Market Works in a Private Enterprise System.

Private Enterprise Objectives
Students will:
1439.2.1 Explore the benefits businesses provide to the economy.
1439.2.2 Compare and contrast the private enterprise system with other economic systems.
1439.2.3 Distinguish between consumer needs and wants and how they are satisfied.
1439.2.4 Explain how consumers affect the supply and demand for goods and services.
1439.2.5 Explain how prices affect consumers and producers.
1439.2.6 Describe the economic resources used in the production of goods and services.
1439.2.7 Identify and discuss economic measurements.
1439.2.8 Describe the four phases of the business cycle.

Standard 3: Social and Ethical Environment of Business (1439.S.3)
Explore Polices of a Diverse Workforce in Business and Marketing.

Social and Ethical Environment Objectives
Students will:
1439.3.1 Describe reasons for layoffs and downsizing.
1439.3.2 Write a job description.
1439.3.3 Discuss on-the-job policies dealing with diversity, drug use on the job, theft in the workplace and sexual harassment.
1439.3.4 Identify the functions, levels and responsibilities of managers.
1439.3.5 Discuss the pros, cons and implications of unionization.
1439.3.6 Explain what is meant by the social responsibilities of business.

Standard 4: Financial Management (1439.S.4)
Demonstrate the Handling of Business Finances.

Financial Management Objectives
Students will:
1439.4.1 Explain the types and purposes of financial statements.
1439.4.2 Describe the responsibilities of the Federal Reserve System.
1439.4.3 Calculate interest and finance charges.
1439.4.4 Identify the purpose, process and implications of obtaining credit.
1439.4.5 Identify laws that protect the consumer when applying for credit.
1439.4.6 Prepare a personal budget.

1439.4.7 Reconcile a bank statement.
1439.4.8 Obtain information regarding services provided by a financial institution.
1439.4.9 Identify the purpose and types of insurance.

Standard 5: Role of Marketing (1439.S.5)
Define the Role of Marketing in Today's World.

Role of Marketing Objectives
Students will:
1439.5.1 Apply the four elements of the marketing mix to products and services.
1439.5.2 Identify the stages of the product life cycle.
1439.5.3 Determine the appropriate channel of distribution for products.
1439.5.4 Identify the steps of pricing.
1439.5.5 Identify the functions of marketing.

Standard 6: Business Structure
Explore Development and Maintenance of a Business.

Business Structure Objectives
Students will:
1439.6.1 Identify unique characteristics of an entrepreneur.
1439.6.2 Compare and contrast the advantages and disadvantages of the types of business ownerships.
1439.6.3 Discuss the opportunities available to an entrepreneur.
1439.6.4 Identify the parts of a business plan and the components.

Standard 7: Government and Business Relationships (1439.S.7)
Explore the Relationship Between Government and Business.

Relationship Between Government and Business Objectives
Students will:
1439.7.1 Examine regulations that are encountered when starting a small business.
1439.7.2 Distinguish between progressive, proportional and regressive taxes.

Standard 8: International Business (1439.S.8)
Define the Importance of International Business in the Market Place.

International Business Objectives
Students will:
1439.8.1 Discuss the pros and cons of free trade.
1439.8.2 List examples of United States imports and exports.
1439.8.3 Identify specific products that currently are subject to government trade policies.
1439.8.4 Compare and contrast the economic systems.
1439.8.5 Identify benefits and challenges to competition in the international marketplace.

Standard 9: Role of a Consumer (1439.S.9)
Identify the Role of a Consumer in Business and Marketing.

Role of a Consumer Objectives
Students will:
1439.9.1 Describe choices consumers make when buying goods and services.
1439.9.2 Discuss the basic rights and responsibilities of a consumer.
1439.9.3 Research why regulations are implemented and the effects the regulations have on consumer safety.

Keyboarding and Information Processing

A one-year course designed to provide learners with keyboarding skills required for success in academic and occupational areas. Concepts in this area include keyboard operation, formatting skills, computer skills, appropriate work habits, and career awareness.

Standard 1: Exhibit Good Work Habits. (1441.S.1)
Exhibit good work habits.

Work Habits Objectives
Students will:

1441.1.1 Follow oral and written instructions in the completion of assigned tasks and plan work efficiently to meet deadlines.
1441.1.2 Exhibit the attitudes and work habits necessary for good interpersonal and employee/employer relations in the workforce.
1441.1.3 Keep the area in and around the workstation organized by properly assembling supplies and information necessary to complete assigned tasks.
1441.1.4 Illustrate desirable work ethics.

Standard 2: Proper Keyboard Operations (1441.S.2)
Demonstrate proper keyboard operation skills.

Keyboard Operations Objectives
Students will:

1441.2.1 Master operation of the alphabet, punctuation, number, and symbol keys by touch.
1441.2.2 Exhibit proofreading skills by visually checking for errors utilizing computer proofreading tools.
1441.2.3 Increase keyboarding speed and accuracy.

Standard 3: Basic Production Skills (1441.S.3)
Apply basic production skills.

Basic Production Skill Objectives
Students will:

1441.3.1 Apply information processing concepts.
1441.3.2 Correctly manipulate document formatting tools.
1441.3.3 Develop language arts skills through composition at the keyboard utilizing capitalization, punctuation, number expression and word usage.
1441.3.4 Using correct grammar, key simple business/personal communications in mailable form.
1441.3.5 Demonstrate basic production and editing skills in keyboarding and formatting copy for short reports, memorandums, personal/business communications from arranged, rough-draft, handwritten, incomplete or unedited copy.
1441.3.6 Illustrate basic formatting skills on enumeration and outlines.
1441.3.7 Identify and correctly use proofreaders' marks.
1441.3.8 Apply horizontal and vertical centering to text.
1441.3.9 Maintain a minimum speed of 40 words per minute with five or fewer errors on a five-minute timed writing.
1441.3.10 Prepare envelopes using USPS style and insert correctly folded letters.
1441.3.11 Key bound and unbound reports with and without special features i.e., endnotes, internal citations, title page, table of contents, and reference page.
1441.3.12 Key various office documents such as minutes of meetings, agendas, cards, labels, forms,

form letters, speeches, tables, and statistical material.
1441.3.13 Practice problem solving and decision-making skills.

Standard 4: Basic Computer Skills (1441.S.4)
Demonstrate basic computer skills.

Basic Computer Skill Objectives
Students will:
1441.4.1 Identify hardware components.
1441.4.2 Demonstrate the proper care and use of hardware and software.
1441.4.3 Be proficient in using operating system commands.
1441.4.4 Demonstrate the functions and common features of word processing software.
1441.4.5 Exhibit an understanding and proper use of document processing terminology.

Standard 5: Careers (1441.S.5)
Investigate careers.

Career Objectives
Students will:
1441.5.1 Integrate the relevance of keyboarding skills to all occupational areas.
1441.5.2 Identify documents relative to an employment portfolio.

Legal Office Management

This course of study is designed to provide the learner with skills to work in a legal office. Major instructional areas include: legal terminology, personal development and employability skills, managing legal records, processing mail, communication duties, applying computing, accounting, and data skills, processing legal correspondence, operating office equipment, using management skills, and completing office support activities.

Standard 1: Client Service Activities (1443.S.1)
Conduct client service activities.

Client Service Activities Objectives
Students will:

1443.1.1 Gather client information and determine referrals based on legal specialty and urgency of request.
1443.1.2 Communicate with officers of the court, administrative agencies, and resource persons.
1443.1.3 Identify procedures for handling client complaints.
1443.1.4 Prepare and manage client records.
1443.1.5 Establish and maintain a forms and template file.
1443.1.6 Initiate a reference manual.
1443.1.7 Add supplements to law library and access Internet resources.
1443.1.8 Maintain a database of officers of the court, administrative agencies, and resource persons.
1443.1.9 Identify procedures for maintaining confidentiality of client information.
1443.1.10 Identify the attitudes and work habits necessary for professional relations with clients and staff in a legal office.
1443.1.11 Identify issues related to electronic transfer of legal documents.

Standard 2: Financial Management (1443.S.2)
Develop financial management skills.

Financial Management Objectives
Students will:

1443.2.1 Collect fees for reporting depositions and court records.
1443.2.2 Maintain firm and client checkbook accounts.
1443.2.3 Key attorney's time sheet.
1443.2.4 Initiate and maintain client account records (including time spent in meetings and phone calls with clients).
1443.2.5 Prepare billing statements.

Standard 3: Legal Correspondence (1443.S.3)
Prepare legal correspondence.

Legal Correspondence Objectives
Students will:

1443.3.1 Use correct legal terms in correspondence.
1443.3.2 Prepare letters in legal format from handwritten copy, from rough-draft copy, and from dictation.
1443.3.4 Edit and revise legal correspondence.

Standard 4: Document Production (1443.S.4)
Display document production techniques.

Document Production Objectives
Students will:

1443.4.1 Transcribe dictated material to prepare legal documents and correspondence.
1443.4.2 Compose correspondence and appropriate forms to request or communicate information.
1443.4.3 Keyboard information using appropriate forms and equipment to format and prepare letters, labels, documents, forms, and statistical reports.
1443.4.4 Proofread documents using visual and written communication skills to verify accuracy and completeness and make any necessary corrections.
1443.4.5 Prepare litigation documents and forms to communicate information.
1443.4.6 Prepare non-litigation documents and forms to communicate information.

Standard 5: Employability Skills (1443.S.5)
Enhance employability skills.

Employability Skill Objectives
Students will:

1443.5.1 Discuss and identify the advantages of a professional affiliation and investigate certification options for legal office personnel.
1443.5.2 Identify personal interests, aptitudes, and attitudes related to the qualities found in successful legal office personal.
1443.5.3 Apply the principles of ergonomics to the legal office work area.
1443.5.4 Develop human relations skills appropriate to dealing with people under stress.
1443.5.5 Promote and exemplify high standards of loyalty, cooperation, and courtesy.
1443.5.6 Develop a career ladder of occupational opportunities in the legal office and related fields.
1443.5.7 Participate in a mock interview for a legal office position.
1443.5.8 Compose a letter of application and an interview follow-up letter.
1443.5.9 Identify the steps to follow in resigning from a position.
1443.5.10 Identify the purpose and types of continuing education.
1443.5.11 Update portfolio.

Medical Office Management

This course of study is designed to provide the (student) learner with skills to work as a medical office assistant. Major instructional objectives include: handling telephone calls, scheduling appointments, greeting patients, and preparing effective communications. Students will: also become proficient with medical records, patient billing, health insurance, financial records, travel arrangements, meeting preparations, and medical terminology. This course is strongly recommended for *Grade 12-Adult.*

Standard 1: Medical Business Legal and Ethical Procedures (1443.S.1)
Analyze medical business ethics and legal responsibilities.

Medical Business Legal and Ethical Procedural Objectives
Students will:
1443.1.1 Identify proper procedures for selecting, preparing, and releasing patient information.
1443.1.2 Summarize safeguards for preventing malpractice litigation as they apply to employees.

Standard 2: Administrative Tasks (1443.S.2)
Conduct and manage administrative responsibilities.

Administrative Responsibilities Objectives
Students will:
1443.2.1 Demonstrate telephone etiquette when screening incoming calls and placing outgoing calls.
1443.2.2 Apply guidelines of scheduling appointments and proper recording of cancellations and no-shows.
1443.2.3 Demonstrate the correct use of alphabetic, geographic, subject, and numeric filing.
1443.2.4 Demonstrate the correct use of alphabetic and numeric color coding for medical records filing.
1443.2.5 Process incoming and outgoing mail via postal service, facsimile, and e-mail.
1443.2.6 Prepare documents from rough-draft copy and from dictation using proper formatting and editing procedures and correct medical terminology.
1443.2.7 Compose written communications for a variety of situations.
1443.2.8 Transcribe dictation and enter reports into a patient's chart using proper medical terminology and abbreviations.
1443.2.9 Analyze coding as related to procedures and diseases.

Standard 3: Insurance Claims (1443.S.3)
Process health insurance claims.

Processing Health Insurance Claim Objectives
Students will:
1443.3.1 Describe and differentiate various types of insurance coverage and insurance plans.
1443.3.2 Prepare (HCFA) Health Care Financing Administration insurance claim forms for various insurance carriers.
1443.3.3 Explain the follow-up process for insurance claims after receiving the EOB (Explanation of Benefits) from the insurance carrier.

Standard 4: Meeting and Travel Preparation (1443.S.4)
Plan medical meetings and arrange travel.

Meeting and Travel Preparation Objectives
Students will:
1443.4.1 Determine guidelines for arranging meetings.

1443.4.2 Key an agenda.
1443.4.3 Key minutes of a meeting.
1443.4.4 Determine guidelines for making travel arrangements.
1443.4.5 Key an itinerary.

Standard 5: Office Management (1443.S.5)
Perform office management skills.

Office Management Objectives
Students will:
1443.5.1 Initiate the development of an office procedures manual.
1443.5.2 Apply the principles of ergonomics to the medical assistant's work area.
1443.5.3 Maintain an inventory of office forms, supplies, and equipment.

Standard 6: Financial Management (1443.S.6)
Develop financial management skills.

Financial Management Objectives
Students will:
1443.6.1 Obtain necessary information from the patient for billing and insurance purposes.
1443.6.2 Compute charges and record appropriate entries for services rendered and charges from the superbill.
1443.6.3 Prepare daily journals.
1443.6.4 Maintain monthly summary records.
1443.6.5 Receive payment for services rendered and issue receipts.
1443.6.6 Reconcile a bank statement.
1443.6.7 Prepare statements/bills on appropriate forms.
1443.6.8 Prepare payroll records.

Standard 7: Employability Skills (1443.S.7)
Enhance employability skills.

Employability Objectives
Students will:
1443.7.1 Discuss and identify advantages of a professional affiliation and investigate certification options for medical office personnel.
1443.7.2 Identify personal interests, aptitudes, and attitudes related to the qualities found in successful medical office personnel.
1443.7.3 Develop human relations skills appropriate to dealing with people under stress.
1443.7.4 Promote and exemplify high standards of loyalty, cooperation and courtesy.
1443.7.5 Develop a career ladder of occupational opportunities in the medical office and related fields.
1443.7.6 Participate in a mock interview for a medical office position.
1443.7.8 Compose a letter of application and an interview follow-up letter.
1443.7.9 Identify the steps to follow in resigning from a position.
1443.7.10 Identify the purpose and types of continuing education.
1443.7.11 Update portfolio.

Management and Entrepreneurship

This course provides a background for the development and operation of a business starting with the role of the entrepreneur in our economy to the development of a business plan and the application of specific marketing skills and concepts within the business environment. This course also explores the planning, organizing and controlling of a business, including organizational and human aspects, with emphasis on various theories of management, the knowledge and understanding necessary for managing people and functions, and decision making.

Standard 1: Careers in Supervision and Management (1445.S.1)
Explore the career of a supervisor/manager.

Supervision and Management Career Objectives
Students will:

1445.1.1 Identify unique characteristics of an entrepreneur.
1445.1.2 Compare and contrast the scientific management, functional, human relations/behavioral school and quantitative approaches of management.
1445.1.3 Identify the characteristics of a successful supervisor/manager.
1445.1.4 Identify and discuss the major demographic and societal trends that will affect supervisors/managers in the future.
1445.1.5 Summarize the difficulties supervisors/managers face in fulfilling managerial roles.

Standard 2: Managerial Functions of Supervision (1445.S.2)
Apply the managerial functions to a supervisor or manager's role.

Managerial Function Objectives
Students will:

1445.2.1 Describe and apply the basic steps of the decision-making process.
1445.2.2 Discuss the functions utilized in management.
1445.2.3 Write a mission statement for a business or department.
1445.2.4 Identify examples of strategic plans, tactical plans and operational plans.
1445.2.5 Explain the concept of a chain of command.

Standard 3: Management Communication Skills (1445.S.3)
Explain the importance of effective communication in the manager's role.

Effective Communication Objectives
Students will:

1445.3.1 Define communication and discuss its implication for effective management in the manager's role.
1445.3.2 Diagram the communication process and explain the importance of each component to the process.
1445.3.3 Identify barriers to communication and suggest methods to overcome those barriers.
1445.3.4 Compare and contrast the formal, informal, horizontal and vertical channels of communication.
1445.3.5 Demonstrate effective communication skills.

Standard 4: Employee Motivation (1445.S.4)
Apply employee motivational factors to the manager's role.

Employee Motivation Objectives

Students will:

1445.4.1 Compare various motivation theories and explain their importance for understanding employee behavior.
1445.4.2 Analyze the application of Theory X and Theory Y in motivating employees.
1445.4.3 Classify motivational factors according to Maslow's hierarchy of needs.
1445.4.4 Define job rotation, job enlargement, and job enrichment and their implications in motivating employees.
1445.4.5 Investigate the significance of Total Quality Management (TQM).
1445.4.6 Explain the concept of authority, responsibility and power as a requirement of any managerial position.
1445.4.7 Define delegation, responsibility and accountability and describe their relationship with one another.

Standard 5: Entrepreneurship (1445.S.5)
Explore the role of an entrepreneur.

Entrepreneur Objectives
Students will:

1445.5.1 Compare and contrast the advantages and disadvantages of the types of ownership.
1445.5.2 Identify entrepreneurial opportunities.
1445.5.3 Analyze the parts of a business plan and components included in each part.
1445.5.4 Write and present a business plan for a small business.

Standard 6: Marketing Plan (1445.S.6)
Write a marketing plan for a small business.

Marketing Plan Objectives
Students will:

1445.6.1 Complete a demographic study to determine a market.
1445.6.2 Determine market potential.
1445.6.3 Identify direct and indirect competition.
1445.6.4 Evaluate competitive strengths and weaknesses.
1445.6.5 Explain the importance of choosing a proper location for a business.
1445.6.6 Describe the different types of goods and services.
1445.6.7 State the marketing concept.
1445.6.8 Utilize market segmentation and target marketing.
1445.6.9 Identify and apply the components of the marketing mix.
1445.6.10 Evaluate the importance of price.
1445.6.11 Describe different pricing strategies.
1445.6.12 Calculate price.
1445.6.13 Describe the steps in the selling process.

Standard 7: Financial Plan (1445.S.7)
Write a financial plan for a small business.

Financial Plan Objectives
Students will:

1445.7.1 Analyze the components of a financial plan.
1445.7.2 Compute capital needs.
1445.7.3 Prepare financial statements (income statement, balance sheet, statement of cash flow).
1445.7.4 Analyze financial statements to ascertain financial health of a business.

1445.7.5 Identify parts of an accounting system.
1445.7.6 Write a personal resume.
1445.7.7 Calculate personal net worth.
1445.7.8 Identify personal/financial assets available to collateralize.
1445.7.9 List potential sources of funds for a business.

Standard 8: Management Plan (1445.S.8)
Write a management plan for a small business.

Management Plan Objectives
Students will:
1445.8.1 Compare and contrast types of business ownership.
1445.8.2 Develop an organizational chart.
1445.8.3 Explain how small businesses recruit effectively.
1445.8.4 Prioritize staffing needs.
1445.8.5 Identify motivational techniques for employees.
1445.8.6 Explain employment laws.
1445.8.7 Monitor results of revenue and explain its impact on inventory, personnel, insurance and promotion.
1445.8.8 Analyze inventory procedures.
1445.8.9 Identify resources available for small business assistance.
1445.8.10 Identify government regulations.
1445.8.11 Research business risks and prevention control.
1445.8.12 List and explain components of a legally enforceable contract.
1445.8.13 Discuss business ethics and social responsibility.

Notetaking and Study Skills

This course is designed to provide students with basic abbreviated writing skills and enables them to take and transcribe notes at speeds appropriate for educational, business, personal use. Students explore reasons for taking notes, ways to listen effectively, and strategies for improving communication and study skills for academic success.

Standard 1: Reading and Writing Abbreviated Writing (1447.S.1)
Read and write the abbreviated writing system.

Reading and Writing Objectives
Students will:

1447.1.1 Read fluently from textbook plates and homework notes.
1447.1.2 Achieve a minimum reading of 80 words per minute.
1447.1.3 Write the abbreviated language for dictated words, abbreviations, and documents.

Standard 2: Transcription and Dictation (1447.S.2)
Demonstrate dictation and transcription skills.

Transcribing and Dictation Objectives
Students will:

1447.2.1 Transcribe the abbreviated language from the textbook plates and homework into longhand using appropriate format.
1447.2.2 Transcribe a variety of business documents (memos, letters, outlines) using appropriate format.
1447.2.3 Take dictation for two to three minutes at a minimum of 50 words per minute with 90% accuracy.
1447.2.4 Use the abbreviated language to take notes from lectures.
1447.2.5 Proofread documents for spelling, punctuation, capitalization, number usage, accuracy of content, and clarity of expression.

Standard 3: Note Making Skills (1447.S.3)
Develop sound note making skills that can be applied to education, career, and personal use.

Applying Note Making Skills Objectives
Students will:

1447.3.1 Practice notetaking skills to process and organize information using the abbreviated writing system.
1447.3.2 Practice notetaking skills from lectures such as the outline format.

Standard 4: Study Skills (1447.S.4)
Develop study skills for academic success.

Success in Academic Studying Skills Objectives
Students will:

1447.4.1 Refine appropriate listening skills.
1447.4.2 Set goals for learning and review progress in meeting these goals.
1447.4.3 Take notes from reading and study for tests using various methods.
1447.4.4 Review and revise notes.
1447.4.5 Develop skills in organizing and managing work stations, setting priorities for tasks, and making decisions.

1447.4.6 Use notetaking skills to prepare reference cards, note cards, and outlines for research.
1447.4.7 Organize study materials (notes, handouts, tests, etc.).
1447.4.8 Demonstrate skill in test-taking techniques.
1447.4.9 Apply all techniques of effective time management.

Office Management

Prerequisite: Keyboarding Applications
This area of study is designed to aid students in becoming skillful in the operation of an office. Major instructional areas include: personal development and employability skills, managing records, processing mail, communication duties, keeping financial records, applying computing, accounting, and data skills, processing business correspondence, operating office equipment, using management skills, and completing office support activities.

Standard 1: Office Administrative Careers (1449.S.1)
Explore office administrative careers.

Office Administrative Career Objectives
The student will:
1449.1.1 Research office administrative positions and their educational requirements.
1449.1.2 Identify confidentiality concepts and policies in an office.
1449.1.3 Identify characteristics of professional conduct (integrity, loyalty, courtesy, etc).
1449.1.4 Discuss personal and office ethics
1449.1.5 Describe attitudes that contribute to success.

Standard 2: Communication Skills (1449.S.2)
Communicate effectively in a professional and personal manner.

Effective Communications Objectives
The student will:
1449.2.1 Create and maintain effective and productive work relationships.
1449.2.2 Develop efficient office teams.
1449.2.3 Compose business correspondence.
1449.2.4 Reproduce and distribute documents and information.
1449.2.5 Prepare camera ready copy.
1449.2.6 Simulate placing and receiving telephone calls including conference calls.
1449.2.7 Prepare written telephone messages.
1449.2.8 Process incoming and out-going mail, including electronic mail.
1449.2.9 Identify emerging telecommunications.

Standard 3: Office System Maintenance (1449.S.3)
Demonstrate maintaining an office system.

Office System Maintenance Objectives
The student will:
1449.3.1 Conduct a needs assessment.
1449.3.2 Prepare and maintain an inventory record of software, furniture, hardware, equipment and supplies.
1449.3.3 Prepare a cost analysis.
1449.3.4 Maintain personal computer/network and printer.
1449.3.5 Demonstrate maintenance of office equipment such as copiers and fax machines (add toner, load paper, clear paper path, change cartridge).
1449.3.6 Discuss and maintain work station safety.

Standard 4: Financial Functions (1449.S.4)
Prepare and manage financial functions.

Financial Objectives
The student will:
1449.4.1 Prepare banking transactions (deposit slips, reconcile bank statement, etc.).
1449.4.2 Manage petty cash funds and cash advance accounts.
1449.4.3 Prepare payroll records.
1449.4.4 Prepare and post check records.
1449.4.5 Determine budgetary requirements for office supplies and equipment. AM2
1449.4.6 Develop an office budget.
1449.4.7 Complete purchase requisitions and vouchers for payment.
1449.4.8 Identify various collection procedures.

Standard 5: Information Management (1449.S.5)
Prepare and manage information.

Information Management Objectives
The student will:
1449.5.1 Maintain alphabetical filing system and retrieve information from files.
1449.5.2 Maintain subject filing system and retrieve information from files.
1449.5.3 Maintain numerical filing system and retrieve information from files.
1449.5.4 Maintain chronological filing system and retrieve information from files.
1449.5.5 Maintain tickler file system and retrieve information from files.

Standard 6: Information and Data Processing (1449.S.6)
Accurately prepare and process information and data.

Preparing and Processing Information and Data Objectives
The student will:
1449.6.1 Key documents (agendas, statistical documents, correspondance, etc.).
1449.6.2 Use touch system of entry on calculators and 10-key pads.
1449.6.3 Transcribe dictation from recorded media (correspondence, reports, minutes of meetings, etc.).
1449.6.4 Dictate notes and correspondence.
1449.6.5 Enhance formatting of documents.
1449.6.6 Create and format tables and charts.
1449.6.7 Perform a variety of word processing functions (merge text, sort data, search/replace data, create macros, etc.).
1449.6.8 Convert document from one operating system to another.
1449.6.9 Create, edit and enhance spreadsheets.
1449.6.10 Create and edit a database.
1449.6.11 Create queries.
1449.6.12 Generate reports
1449.6.13 Integrate database, spreadsheet, graphic and word processing files.
1449.6.10 Develop text editing and proofreading skills.

Standard 7: Organizing and Planning (1449.S.7)
Demonstrate organizing and planning functions.

Organizing and Planning Objectives
The student will:
1449.7.1 Demonstrate time management skills.
1449.7.2 Coordinate meetings, events and travel arrangements related to the office.
1449.7.3 Recommend improvements in physical layout of the office.
1449.7.4 Follow written and oral directions.
1449.7.5 Give written and oral directions.

1449.7.6 Discuss and maintain office safety

Standard 8: Human Relationship Skills (1449.S.8)
Demonstrate human relations skills.

Human Relation Objectives
The student will:
1449.8.1 Develop work processes and procedures (organizational and prioritizing skills).
1449.8.2 Develop techniques for introducing and implementing changes.
1449.8.3 Coordinate administrative support staff work schedule and workload distribution.
1449.8.4 Provide feedback to teams and individuals.
1449.8.5 Contribute to development of job descriptions for administrative support staff.
1449.8.6 Discuss and analyze an employee performance evaluation

Standard 9: Employability
Develop employability skills. **(1449.S.9)**

Employability Objectives
The student will:
1449.9.1 Develop a career plan and professional growth plan.
1449.9.2 Develop and update a resume.
1449.9.3 Complete a job application form and write a letter of application.
1449.9.4 Demonstrate successful interviewing techniques.
1449.9.5 Develop and maintain a portfolio.
1449.9.6 Apply for a promotion.
1449.9.7 Identify the steps to follow in resigning from a position.
1449.9.8 Discuss soliciting letters of recommendation.

Personal Finance

Personal Finance is a multi-disciplinary approach to personal financial management for high school students.

Standard 1: Interrelated Roles (1451.S.1)
Describe the interrelated roles of job seeker, wage earner and employee.

Interrelated Roles Objectives
The student will:
1451.1.1 Explain job search strategies.
1451.1.2 Describe effective tools for securing employment including resume, application letter, interview, and follow-up.
1451.1.3 List examples of employee and employer responsibilities at the workplace.
1451.1.4 Discuss employee benefits, labor unions and professional organizations.
1451.1.5 Identify ethical character traits, such as honesty, integrity, compassion, respect, responsibility, citizenship and justice.

Standard 2: Analyzing and Interpreting (1451.S.2)
Analyze and interpret decisions that contribute to financial stability and personal satisfaction.

Analyzing and Interpreting Objectives
The student will:
1451.2.1 Prepare financial planning documents and describe types of contracts.
1451.2.2 Prepare documents used with checking accounts, and compare consumer banking services.
1451.2.3 Explain purposes, types and history of taxes.
1451.2.4 Prepare a short form tax return.
1451.2.5 Give examples of savings options, discuss the need for and purpose of savings and compute interest on savings.
1451.2.6 Discuss investment options, the need for and purpose of investments and the criteria for choosing investments.
1451.2.7 Identify principles of risk management.
1451.2.8 Describe benefits of major types of insurance.

Standard 3: Credit Planning (1451.S.3)
Describe credit and plans for using credit in terms of present and future needs and income.

Credit Planning Objectives
The student will:
1451.3.1 List advantages and disadvantages of credit, types of credit and sources of credit.
1451.3.2 Discuss the concept of creditworthiness as it relates to credit records, credit ratings, credit reports, and credit laws.
1451.3.3 Compute the costs of credit.
1451.3.4 Discuss methods of reducing credit costs and responsibilities of consumer credit.
1451.3.5 List major causes of bankruptcy.
1451.3.6 Identify the advantages and disadvantages of bankruptcy.
1451.3.7 Discuss bankruptcy laws and their purpose and understand how to solve credit problems.

Standard 4: Economic and Consumer Responsibility (1451.S.1)
Describe common economic problems and consumer responsibility in the marketplace.

Common Economic Problems/Consumer Responsibility Objectives

The student will:

1451.4.1 Discuss characteristics of the marketplace and the free enterprise system.

1451.4.2 Identify fraudulent and deceptive practices, and prescribe wise consumer behavior.

1451.4.3 List consumer Legislation, sources of consumer protection, and describe how to contact public officials to express opinions.

1451.4.4 Describe the court system available for use in consumer redress and list other ways of finding remedies for consumer problems.

Spreadsheet Management

This area of study is designed to develop intermediate/advanced-level skills in spreadsheet application software. Students will achieve proficiency and expert level skills and will have the opportunity to receive specialized certification by examination. (One semester class)

Standard 1: Worksheets (1453.S.1)
Format worksheets.

Worksheet Objectives
The student will:
1453.1.1 Apply formats such as accounting, fraction, scientific, etc.
1453.1.2 Create custom formats.
1453.1.3 Use styles and auto formats.

Standard 2: Lists (1453.S.2)
Use lists.

List Objectives
The student will:
1453.2.1 Sort data.
1453.2.2 Query from a list.

Standard 3: Workbooks (1453.S.3)
Print workbooks.

Workbook Printing Objectives
The student will:
1453.3.1 Preview workbooks.
1453.3.2 Print workbooks.

Standard 4: Auditing Worksheets (1453.S.4)
Audit a worksheet.

Worksheet Auditing Objectives
The student will:
1453.4.1 Check and review data.
1453.4.2 Find cells referred to in a specific formula.
1453.4.2 Find formulas that refer to a specific cell.
1453.4.3 Find errors.

Standard 5: Functionality (1453.S.5)
Use advanced functionality.

Functionality Objectives
The student will:
Query databases.
1453.5.1 Extract data.
1453.5.2 Use filters.
1453.5.3 Use data analysis and pivot tables.
1453.5.4 Use data map.
1453.5.5 Use data validation.
1453.5.6 Use conditional formatting.
1453.5.7 Perform multi-level sorts.

Standard 6: Macros (1453.S.6)

Use macros.

Macros Objectives
The student will:
1453.6.1 Create and record macros.
1453.6.2 Edit macros.
1453.6.3 Run macros.

Standard 7: Import and Export Data (1453.S.7)
Import and export data.

Data Importing and Exporting Objectives
The student will:
1453.7.1 Import from other applications.
1453.7.2 Export to other applications.

Standard 8: Templates (1453.S.8)
Use templates.

Template Objectives
The student will:
1453.8.1 Work with existing templates.
1453.8.2 Create templates.
1453.8.3 Edit templates.

Standard 9: Multiple Workbooks (1453.S.9)
Use multiple workbooks.

Multiple Workbook Objectives
The student will:
1453.9.1 Link workbooks.
1453.9.2 Use multiple workbooks.

Standard 10: Workgroup Functions (1453.S.10)
Use workgroup functions.

Workgroup Objectives
The student will:
1453.10.1 Cell tips.
1453.10.2 Share lists.
1453.10.3 Track changes.
1453.10.4 Resolve conflicts.
1453.10.5 Show history of changes.
1453.10.6 Merge workbooks.

Web Page Publishing

This course will introduce students to the basic Web page design concepts and provide practice in creating Web sites. Students will explore various applications in Web page design through hands-on activities and experiences which may include: using Web page development software, creating page layouts, adding images and frames, creating elements and components, creating tables, managing files, publishing to the Internet, creating hyperlinks, organizing tasks, and using HTML.

Standard 1: Basic Design Concepts (1455.S.1)
Discuss web page design concepts.

Basic Web Design Objectives
The student will:
1455.1.1 Acquire navigational skills for using the World Wide Web effectively.
1455.1.2 Define and use Web page design terminology.
1455.1.3 Identify Web page design concepts: i.e. themes, bullets, importing, hyperlinks, and frames.
1455.1.4 Identify confidentiality concepts and policies.
1455.1.5 Identify characteristics of professional conduct.
1455.1.6 Identify and analyze Web page design career opportunities.

Standard 2: Web Page Design Software (1455.S.2)
Demonstrate skills utilizing Web Page design software.

Web Page Design Software Objectives
The student will:
1455.2.1 Create and edit a Web page using HTML.
1455.2.2 Insert images, change image appearance, create Hotspots, and use frames.
1455.2.3 Plan and design a web page, create a page with a Wizard, add pages to a web, add text and format a page.
1455.2.4 Add multimedia elements and enhancements, i.e. sound and video to a Web page.
1455.2.5 Use a digital camera and a scanner to import visuals in a Web page.
1455.2.6 Create a Web Site using templates, themes, insert bullets, import from different software.
1455.2.7 Create and edit Hyperlinks.
1455.2.8 Create a table, add rows and columns, split and merge cells, and change properties.
1455.2.9 Customize elements and components of a Web page, create a custom theme, create page transitions, add hit counter, and create a search form.
1455.2.10 Practice usability testing for uploading Web pages.
1455.2.11 Publish a Web page.
1455.2.12 Manage a Web site (check spelling and change text, work with files, manage hyperlinks and organize tasks).
1455.2.13 Practice programming using JavaScript.
1455.2.14 Evaluate competing Web sites.

Standard 3: Legal and Ethical (1455.S.3)
Determine legal and ethical aspects of Web page publishing.

Legal and Ethical Objectives
The student will:
1455.3.1 Practice ethical use of World Wide Web
1455.3.2 Identify copyright and patent laws pertaining to Web page publication.
1455.3.3 Identify licensing agreements associated with Web Page Design software.
1455.3.4 Explain the purpose of deductions and withholdings.

Diversified Cooperative Training I (DCT)

This area of study is designed to provide students with a wide range of basic attitudes, knowledge, and skills essential for job success.

Standard 1: Health and Safety Procedures (0511.S.1)
Demonstrate the correct procedures to promote health and safety, personally and professionally.

Health and Safety Procedures Objectives
Students will:
0511.1.1 List the most basic safety rules.
0511.1.2 Identify the main causes of accidents and describe ways to reduce safety hazards.
0511.1.3 List the agencies that work to prevent accidents and explain each agency's purpose.
0511.1.4 Propose and follow a plan for the proper procedure in handling accidents.
0511.1.5 Develop a list of personal safety rules as they apply personally and professionally.
0511.1.6 Read and interpret operating instructions before using any equipment.
0511.1.7 Describe the procedures for safe evacuation of the work site in the event of an emergency.
0511.1.8 Classify A, B, and C fires and describes methods of extinguishing.
0511.1.9 Demonstrate procedures for proper lifting methods.

Standard 2: Communications, Critical Thinking, Computation and Computer Applications (0511.S.2)
Use basic skills as applied to communications, critical thinking, computation, and computer applications.

Communications, Critical Thinking, Computation and Computer Applications Objectives
Students will:
0511.2.1 Identify ways of giving orders, directions, and instructions in non-stereotypical language.
0511.2.2 Demonstrate the proper way to introduce yourself and others.
0511.2.3 Use proper telephone protocol and correctly handle messages.
0511.2.4 Develop and practice skills of organizing and delivering oral communications.
0511.2.5 Identify barriers to listening and analyze methods for improving listening.
0511.2.6 Take meaningful notes to recall and accurately report information from an oral presentation.
0511.2.7 Solve problems involving addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions.
0511.2.8 Solve problems using different wage plans.
0511.2.9 Compute trade or cash discounts to arrive at net price.

Standard 3: Professionalism (0511.S.3)
Exhibit responsibility, self-esteem, sociability, self-management, integrity and honesty.

Professionalism Objectives
Students will:
0511.3.1 State the values of having self-respect and a good self-concept.
0511.3.2 Develop a plan for self-improvement through evaluation and constructive criticism by varied levels of authority.
0511.3.3 Identify the steps for creating and maintaining a positive attitude.
0511.3.4 Describe and demonstrate the characteristics of professional conduct.
0511.3.5 Explain ways to participate with others as part of a team.
0511.3.6 List the steps to problem solving.
0511.3.7 Expose students to the opportunities of participating and contributing to professional organizations.

Standard 4: Personal and Financial Resources (0511.S.4)
Identify, organize, plan and allocate resources.

Resource Objectives
Students will:
0511.4.1 Prepare a list of short-term and long-term goals.
0511.4.2 Utilize time management techniques.
0511.4.3 Prepare a budget.
0511.4.4 List and explain the range of services offered customers by banks and credit unions.
0511.4.5 List the steps involved in opening and maintaining different financial accounts.
0511.4.6 Identify the different types of credit and loans and the guidelines for obtaining each.
0511.4.7 State the purpose of insurance.
0511.4.8 Describe workers compensation and employment security programs.

Standard 5: Legal Rights and Obligations (0511.S.5)
Identify necessary legal rights and obligations as related to the workplace.

Legal Rights and Obligations Objectives
Students will:
0511.5.1 List the components necessary in obtaining a legal contract.
0511.5.2 Develop an awareness of one's legal rights and obligations as a productive member of society.
0511.5.3 Classify laws relating to working conditions, wages, hours, social security, and taxes.
0511.5.4 Define sexual harassment and its consequences to all parties involved.
0511.5.5 Choose ethical courses of action and exhibit honesty and reliability in words and actions.

Standard 6: Inter-Relationships (0511.S.6)
Describe the inter-relationships of various social, organizational, and technological systems.

Inter-Relationships Objectives
Students will:
0511.6.1 Identify the types of business ownership.
0511.6.2 Identify the characteristics of global economic systems.
0511.6.3 List the role of government in the U.S. economy.
0511.6.4 Discuss the functions of supply and demand and its influence on the economy.
0511.6.5 Identify the benefits of competition and profit.
0511.6.6 Discuss advantages and disadvantages of self-employment.
0511.6.7 Identify common characteristics of labor unions.
0511.6.8 List reasons labor unions began.
0511.6.9 Explain and demonstrate the concept of collective bargaining.
0511.6.10 Use parliamentary procedure to conduct a meeting.
0511.6.11 Define leadership and develop leadership skills.
0511.6.12 Compare the purposes of school and community organizations.
0511.6.13 Develop socialization and team skills through group activities.
0511.6.14 Exhibit mastery of leadership and technical skills through competitive events.

Standard 7: Job-Seeking, Job-Keeping, and Job-Leaving Skills (0511.S.7)
Develop job-seeking, job-keeping, and job-leaving skills.

Job-Seeking, Job-Keeping, and Job-Leaving Skills Objectives
Students will:
0511.7.1 Compose an employment portfolio, in basic business format, including a resume, cover letter, follow-up letter, letters of acceptance/rejection, and letter of resignation.
0511.7.2 Complete a job application.

0511.7.3 Identify sources of employment opportunities and the steps to initiate a job search.
0511.7.4 Respond positively in all aspects of an interview situation.
0511.7.5 Identify, select, and use technological equipment relevant to the occupation.
0511.7.6 Describe the importance of following a chain of command on the job.
0511.7.7 Appraise the importance of punctuality and dependability on the job.
0511.7.8 Analyze the necessity of mastering job skills.
0511.7.9 Demonstrate how to ask for a raise.
0511.7.10 Participate in an exit interview.
0511.7.11 Identify ways to handle loss of employment.
0511.7.12 Write a letter of reference which could be signed by an employer.
0511.7.13 Discuss reasons people work.
0511.7.14 Use the *Occupational Outlook Handbook* to prepare an occupational information search.
0511.7.15 Explain how occupations and industries are grouped in career clusters.

DIVERSIFIED COOPERATIVE TRAINING II (DCT)

This area of study is designed to provide students with a wide range of basic attitudes, knowledge, and skills essential for job success.

Standard 1: Health and Safety Procedures (0512.S.1)
Demonstrate the correct procedures to promote health and safety, personally and professionally.

Health and Safety Procedures Objectives
Students will:
0512.1.1 List the most basic safety rules.
0512.1.2 Identify the main causes of accidents and describe ways to reduce safety hazards.
0512.1.3 List the agencies that work to prevent accidents and explain each agency's purpose.
0512.1.4 Propose and follow a plan for the proper procedure in handling accidents.
0512.1.5 Develop a list of personal safety rules as they apply personally and professionally.
0512.1.6 Read and interpret operating instructions before using any equipment.
0512.1.7 Describe the procedures for safe evacuation of the work site in the event of an emergency.
0512.1.8 Classify A, B, and C fires and describes methods of extinguishing.
0512.1.9 Demonstrate procedures for proper lifting methods.

Standard 2: Communications, Critical Thinking, Computation and Computer Applications (0512.S.2)
Use basic skills as applied to communications, critical thinking, computation, and computer applications.

Communications, Critical Thinking, Computation and Computer Applications Objectives
Students will:
0512.2.1 Identify ways of giving orders, directions, and instructions in non-stereotypical language.
0512.2.2 Demonstrate the proper way to introduce yourself and others.
0512.2.3 Use proper telephone protocol and correctly handle messages.
0512.2.4 Develop and practice skills of organizing and delivering oral communications.
0512.2.5 Identify barriers to listening and analyze methods for improving listening.
0512.2.6 Take meaningful notes to recall and accurately report information from an oral presentation.
0512.2.7 Solve problems involving addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions.
0512.2.8 Solve problems using different wage plans.
0512.2.9 Compute trade or cash discounts to arrive at net price.

Standard 3: Professionalism (0512.S.3)
Exhibit responsibility, self-esteem, sociability, self-management, integrity and honesty.

Professionalism Objectives
Students will:
0512.3.1 State the values of having self-respect and a good self-concept.
0512.3.2 Develop a plan for self-improvement through evaluation and constructive criticism by varied levels of authority.
0512.3.3 Identify the steps for creating and maintaining a positive attitude.
0512.3.4 Describe and demonstrate the characteristics of professional conduct.
0512.3.5 Explain ways to participate with others as part of a team.
0512.3.6 List the steps to problem solving.
0512.3.7 Expose students to the opportunities of participating and contributing to professional organizations.

Standard 4: Personal and Financial Resources (0512.S.4)
Identify, organize, plan and allocate resources.

Resource Objectives
Students will:
0512.4.1 Prepare a list of short-term and long-term goals.
0512.4.2 Utilize time management techniques.
0512.4.3 Prepare a budget.
0512.4.4 List and explain the range of services offered customers by banks and credit unions.
0512.4.5 List the steps involved in opening and maintaining different financial accounts.
0512.4.6 Identify the different types of credit and loans and the guidelines for obtaining each.
0512.4.7 State the purpose of insurance.
0512.4.8 Describe workers compensation and employment security programs.

Standard 5: Legal Rights and Obligations (0512.S.5)
Identify necessary legal rights and obligations as related to the workplace.

Legal Rights and Obligations Objectives
Students will:
0512.5.1 List the components necessary in obtaining a legal contract.
0512.5.2 Develop an awareness of one's legal rights and obligations as a productive member of society.
0512.5.3 Classify laws relating to working conditions, wages, hours, social security, and taxes.
0512.5.4 Define sexual harassment and its consequences to all parties involved.
0512.5.5 Choose ethical courses of action and exhibit honesty and reliability in words and actions.

Standard 6: Inter-Relationships (0512.S.6)
Describe the inter-relationships of various social, organizational, and technological systems.

Inter-Relationships Objectives
Students will:
0512.6.1 Identify the types of business ownership.
0512.6.2 Identify the characteristics of global economic systems.
0512.6.3 List the role of government in the U.S. economy.
0512.6.4 Discuss the functions of supply and demand and its influence on the economy.
0512.6.5 Identify the benefits of competition and profit.
0512.6.6 Discuss advantages and disadvantages of self-employment.
0512.6.7 Identify common characteristics of labor unions.
0512.6.8 List reasons labor unions began.
0512.6.9 Explain and demonstrate the concept of collective bargaining.
0512.6.10 Use parliamentary procedure to conduct a meeting.
0512.6.11 Define leadership and develop leadership skills.
0512.6.12 Compare the purposes of school and community organizations.
0512.6.13 Develop socialization and team skills through group activities.
0512.6.14 Exhibit mastery of leadership and technical skills through competitive events.

Standard 7: Job-Seeking, Job-Keeping, and Job-Leaving Skills (0512.S.7)
Develop job-seeking, job-keeping, and job-leaving skills.

Job-Seeking, Job-Keeping, and Job-Leaving Skills Objectives
Students will:
0512.7.1 Compose an employment portfolio, in basic business format, including a resume, cover letter, follow-up letter, letters of acceptance/rejection, and letter of resignation.
0512.7.2 Complete a job application.

0512.7.3 Identify sources of employment opportunities and the steps to initiate a job search.
0512.7.4 Respond positively in all aspects of an interview situation.
0512.7.5 Identify, select, and use technological equipment relevant to the occupation.
0512.7.6 Describe the importance of following a chain of command on the job.
0512.7.7 Appraise the importance of punctuality and dependability on the job.
0512.7.8 Analyze the necessity of mastering job skills.
0512.7.9 Demonstrate how to ask for a raise.
0512.7.10 Participate in an exit interview.
0512.7.11 Identify ways to handle loss of employment.
0512.7.12 Write a letter of reference which could be signed by an employer.
0512.7.13 Discuss reasons people work.
0512.7.14 Use the *Occupational Outlook Handbook* to prepare an occupational information search.
0512.7.15 Explain how occupations and industries are grouped in career clusters.

Life Connections

This course will enable students to develop skills for assuming their role in society as productive, successful individuals. Recommended Grade Level: 11-12.

Standard 1: Management (0901.S.1)
The students will develop criteria for managing different phases of one's life span.

Management Objectives
Students will:
0901.1.1 Use decision-making skills to solve problems.
0901.1.2 Analyze components of the management process.
0901.1.3 Examine management needs at various stages of life.
0901.1.4 Develop strategies for managing financial resources.
0901.1.5 Investigate ways to protect environmental resources.
0901.1.6 Practice consumer decisions that meet basic human needs.

Standard 2: Relationships (0901.S.2)
The students will develop an understanding of the different aspects of a healthy, positive relationship.

Relationships Objectives
Students will:
0901.2.1 Evaluate components of respectful health relationships.
0901.2.2 Demonstrate communication skills that contribute to positive relationships.
0901.2.3 Practice conflict resolution techniques.
0901.2.4 Demonstrate leadership skills and community involvement.

Standard 3: Parenting (0901.S.3)
The students will investigate the different phases of parenting and parenting skills.

Parenting Objectives
Students will:
0901.3.1 Analyze parenting roles and responsibilities.
0901.3.2 Explore the impact of diversity on families and society.
0901.3.3 Examine basic parenting skills.
0901.3.4 Investigate laws and services that impact parenting.

Standard 4: Wellness (0901.S.4)
The students will develop an understanding of how food choices can impact one's health and lifestyle.

Wellness Objectives
Students will:
0901.4.1 Evaluate the impact of food choices on wellness.
0901.4.2 Formulate a plan to achieve a health lifestyle.

Standard 5: Careers and Technology (0901.S.5)
The students will demonstrate an understanding of selecting a career and how electronic technologies are used within these career fields.

Careers and Technology Objectives
Students will:
0901.5.1 Develop criteria for making career choices.
0901.5.2 Evaluate strategies for balancing work and personal life.
0901.5.3 Use electronic technologies to complete a variety of assignments.
0901.5.4 Demonstrate appropriate written and oral communications.

Parenting And Child Development

This course is designed to help students evaluate readiness for parenting while examining appropriate parenting and child development practices. Students will develop an awareness of societal issues affecting families and explore support systems. Other areas of focus will be career management and technology. Recommended Grade Level: 9-12.

Standard 1: Readiness for Parenting (0902.S.1)
The students will demonstrate an understanding of the roles and responsibilities of parenting.

Readiness for Parenting Objectives
Students will:
0902.1.1 Describe roles and responsibilities of parenting.
0902.1.2 Analyze personal readiness for parenting.
0902.1.3 Examine family structures.
0902.1.4 Review biological processes related to conception.
0902.1.5 Evaluate contraceptive methods.

Standard 2: Appropriate Parenting/Child Development Practices (0902.S.2)
The students will demonstrate an understanding of appropriate parenting/child development practices.

Parenting/Child Development Practices Objectives
Students will:
0902.2.1 Analyze factors which contribute to prenatal health.
0902.2.2 Review birth processes.
0902.2.3 Analyze factors which contribute to post-natal health.
0902.2.4 Cite theories related to child development.
0902.2.5 Examine the physical, emotional, social, intellectual and moral development of children.
0902.2.6 Evaluate parenting practices that promote health, safety and wellness.
0902.2.7 Recognize appropriate realistic guidance, discipline, and communication techniques.
0902.2.8 Examine the types, causes and effects of child abuse.
0902.2.9 Analyze parenting practices for children with special needs.

Standard 3: Societal Issues Affecting Families (0902.S.3)
The students will explore and evaluate the societal issues affecting families.

Societal Issues Affecting Families Objectives
Students will:
0902.3.1 Explore the impact of diversity on families and society.
0902.3.2 Formulate a plan to deal with crises in families.
0902.3.3 Investigate the legal and ethical impact of science and technology.

Standard 4: Support Systems For Families (0902.S.4)
The students will explore and develop criteria for a family support system.

Support Systems For Families Objectives
Students will:
0902.4.1 Develop criteria for evaluating child care alternatives.
0902.4.2 Review current laws related to parenting.
0902.4.3 Assess sources of assistance available to families.

Standard 5: Career Management and Technology (0902.S.5)
The students will demonstrate an understanding of careers in the area of parenting/child development and how electronic technologies are used within these career fields.

Career Management and Technology Objectives
Students will:
0902.5.1 Explore career opportunities related to parenting/child development.
0902.5.2 Use electronic technologies to complete a variety of assignments.
0902.5.3 Demonstrate appropriate written and oral communications.

Consumer Economics

This course will enable students to analyze human economics and environmental resources. Grades 9-12.

Standard 1: Human Economic and Environmental Resources (0911.S.1)
The students will analyze individual, family and community needs.

Human Economic and Environmental Resources Objectives
Students will:
0911.1.1 Demonstrate management of individual and family needs, including food, clothing, shelter, health care, recreation, and transportation.
0911.1.2 Apply management and planning skills and processes to organize tasks and responsibilities.
0911.1.3 Examine how individuals and families make choices to satisfy needs and wants.
0911.1.4 Implement decisions about providing safe and nutritious food for individuals and families.
0911.1.5 Implement decisions about purchasing, creating, and maintaining clothing.
0911.1.6 Implement decisions about housing and furnishings.
0911.1.7 Examine information about procuring and maintaining health care.
0911.1.8 Implement decisions about recreational needs.
0911.1.9 Apply consumer skills to acquire and maintain transportation.

Standard 2: Environment (0911.S.2)
The students will analyze the relationship of the environment to family and consumer resources.

Environment Objectives
Students will:
0911.2.1 Determine individual and family responsibility in relationship to the environmental trends and issues.
0911.2.2 Examine behaviors that conserve, reuse, and recycle resources to maintain the environment.
0911.2.3 Investigate government regulations for conserving natural resources.

Standard 3: Consumer Rights and Responsibilities (0911.S.3)
The students will analyze policies that support consumer rights and responsibilities.

Consumer Rights and Responsibilities Objectives
Students will:
0911.3.1 Examine state and federal policies and laws providing consumer protection.
0911.3.2 Investigate how policies become laws related to consumer rights.
0911.3.3 Examine skills used in seeking information related to the individual consumer.

Standard 4: Technology Impact (0911.S.4)
The students will evaluate the impact of technology on individual and family resources.

Technology Impact Objectives
Students will:
0911.4.1 Review types of technology that impact family and consumer decision-making.
0911.4.2 Examine how media and technological advances impact family and consumers decisions.
0911.4.3 Assess the use of technology and its impact on quality of life.

Standard 5: Economic System vs. Consumer Actions (0911.S.5)
Students will analyze interrelationships between the economic system and consumer actions.

Economic System vs. Consumer Actions Objectives
Students will:
0911.5.1 Examine the use of resources in making choices that satisfy needs and wants of individuals and families.
0911.5.2 Examine individual and family roles in the economic system.
0911.5.3 Examine economic impacts of laws and regulations that pertain to consumers and providers of services.
0911.5.4 Determine practices that allow families to maintain economic self-sufficiency.

Standard 6: Financial Resources Management (0911.S.6)
Students will demonstrate management of financial resources to meet the goals of individuals and families across the life span.

Financial Resources Management Objectives
Students will:
0911.6.1 Examine the need for personal and family financial planning.
0911.6.2 Apply management principles to decisions about individual and family insurance.
0911.6.3 Obtain personal and legal documents related to managing individual and family finances

Standard 7: Consumer Service Industries Career Paths (0911.S.7)
Student will analyze career paths within consumer service industries.

Consumer Service Industries Career Paths Objectives
Students will:
0911.7.1 Determine roles and functions of individuals engaged in consumer service careers.
0911.7.2 Explore opportunities for employment and entrepreneurial endeavors.
0911.7.3 Examine education and training requirements and opportunities for career paths in consumer services.
0911.7.4 Examine the impact of the consumer service industry on local, state, national and global economies.

Standard 8: Consumer Advocacy (0911.S.8)
Students will analyze factors that impact consumer advocacy.

Consumer Advocacy Objectives
Students will:
0911.8.1 Examine the role of advocacy groups at state and national levels.
0911.8.2 Determine the contributions of policy makers to consumer advocacy.
0911.8.3 Explore strategies that enable consumers to become advocates.
0911.8.4 Examine the effects of consumer protection laws on advocacy.
0911.8.5 Determine strategies to reduce the risk of consumer fraud.
0911.8.6 Examine the role of media in consumer advocacy.
0911.8.7 Determine the effects of manufacturers' policies and procedures on advocacy.
0911.8.8 Explore the use of educational and promotional materials in consumer advocacy.

Standard 9: Long-term Financial Management (0911.S.9)
Students will analyze factors in developing a long-term financial management plan.

Long-term Financial Management Objectives
Students will:
0911.9.1 Explain the impact of the economic system on personal income, individual and family security and consumer decisions.

0911.9.2 Examine components of a financial planning process that reflects the distinction between needs and wants, values, goals, and economic resources.
0911.9.3 Determine the impact on consumers' credit in long-term financial planning.
0911.9.4 Examine investment and savings alternatives.
0911.9.5 Determine the effects of risk management strategies on long term financial planning.
0911.9.6 Consider the impact of key life transitions on financial planning.
0911.9.7 Explain the role of estate planning in long-term financial planning.

Standard 10: Conservation and Waste Management (0911.S.10)
Students will analyze resource consumption for conservation and waste management practices.

Conservation and Waste Management Objectives
Students will:
0911.10.1 Investigate sources and types of commercial energy, waste disposal, and pollution issues.
0911.10.2 Investigate consumer programs and services provided by government, public utilities, resource recovery businesses, and environmental organizations.
0911.10.3 Explore strategies and provide practices to conserve energy and distribute or find information.
0911.10.4 Examine waste management issues.
0911.10.5 Examine roles of government and mixed industry in energy consumption.

Standard 11: Product Development, Testing and Presentation (0911.S.11)
Students will demonstrate skills needed for product development, testing, and presentation.

Product Development, Testing and Presentation Objectives
Students will:
0911.11.1 Conduct market research to determine consumer trends and product development needs.
0911.11.2 Design or analyze a consumer product.
0911.11.3 Examine features, prices, product information, styles, and performance of consumer goods for potential trade-offs among the components.
0911.11.4 Perform a test on a product utilizing valid and reliable testing procedures.
0911.11.5 Apply statistical analysis processes to interpret, summarize, and report data from tests.
0911.11.6 Examine the labeling, packaging, and support materials of consumer goods.
0911.11.7 Demonstrate a product or educate an audience.
0911.11.8 Utilize appropriate sales techniques to compare, demonstrate, assist, and advise consumers in the selection of goods and services that meet consumer needs.

Adolescent Parent Program

The focus of this course is to assist the pregnant and parenting teen to complete his/her education by balancing the responsibilities of parenthood and schoolwork.

Standard 1: Adolescent Development (0921.S.1)
The student will analyze present and future life stages.

Adolescent Development Objectives
Students will:

0921.1.1 Describe the steps in the decision-making model and be able to apply them to individual situations.
0921.1.2 Determine life skills necessary to live and prosper in the real world.
0921.1.3 Explain how lifestyle factors influence quality of life.
0921.1.4 Develop verbal and written communication skills.
0921.1.5 Assess self-esteem and its effects upon the self and others.
0921.1.6 Analyze the role of individual responsibility for enhancing health.
0921.1.7 Assess the positive and negative effects of stressors on the body, and develop strategies to cope with stress.

Standard 2: Prenatal Care (0921.S.2)
The student will gain knowledge on how to reduce pregnancy risks.

Prenatal Care Objectives
Students will:

0921.2.1 Describe the male and female reproductive organs and how the process of conception occurs.
0921.2.2 Describe maternal changes during pregnancy.
0921.2.3 Identify ways of meeting the mother's changing physical and emotional needs.
0921.2.4 Evaluate nutritional needs of pregnant and lactating teens.
0921.2.5 Identify nutrients required for fetal development.
0921.2.6 Describe a baby's development from conception to birth.
0921.2.7 Describe the dangers to the baby if the mother smokes, takes drugs or drinks alcohol during her pregnancy.
0921.2.8 Identify environmental influences that cause birth defects or problems for the baby.
0921.2.9 Assess factors related to sexually transmitted diseases and these diseases' effects on the mother and the baby.
0921.2.10 Describe the physical and psychological implications of prenatal exercise and fitness.
0921.2.11 Describe warning signs that may indicate problems for the baby before birth.
0921.2.12 Identify the purpose and procedures of obstetric examinations.
0921.2.13 Explain the labor and delivery process.
0921.2.14 Describe the mother's postpartum care needs.
0921.2.15 Describe characteristics and care of the newborn at the hospital.
0921.2.16 Explain newborn care practices.
0921.2.17 Plan for the prevention of future unwanted pregnancies.

Standard 3: Parenting Roles (0921.S.3)
The student will investigate the role of a responsible parent.

Parenting Roles Objectives
Students will:

0921.3.1 Assess parenting roles and responsibilities in child rearing.
0921.3.2 Discuss reasonable actions to solve common parenting concerns.
0921.3.3 Demonstrate appropriate discipline for children.
0921.3.4 Examine alternative child-care choices.

0921.3.5 Compare the effectiveness of meeting the needs of children.

Standard 4: Child Development (0921.S.4)
The student will access methods to aid in child development.

Child Development Objectives
Students will:
0921.4.1 Describe the realities of caring for a newborn.
0921.4.2 Demonstrate techniques for bathing a baby, preventing and treating diaper rash, caring for a colicky baby, and dealing with a crying baby.
0921.4.3 Demonstrate methods of interacting and playing with children.
0921.4.4 Describe the social, emotional, mental, and physical stages of the developing child, identify factors affecting this development and list the importance of realistic expectations.
0921.4.5 Discuss the factors that influence a child's self-concept.
0921.4.6 Create ways to enhance children's self-worth.
0921.4.7 Demonstrate effective skills for interacting with children, (i.e. touching, massage, talking, role-modeling.)
0921.4.8 Examine children's health and safety issues.
0921.4.9 Research how to childproof a home and eliminate hazards.
0921.4.10 Describe how to select books for young children and techniques for reading to children.
0921.4.11 Describe first-aid skills for common childhood injuries.
0921.4.12 Demonstrate basic cardiopulmonary resuscitation.

Standard 5: Child Nutrition (0921.S.5)
The student will develop an understanding of how food choices will impact a child's health and wellness.

Child Nutrition Objectives
Students will:
0921.5.1 Analyze the nutritional needs of infants.
0921.5.2 Evaluate children's nutritional needs for a healthy lifestyle.
0921.5.3 Create interesting, fun, and nutritional snacks for children.

Standard 6: Financial and Community Resources (0921.S.6)
The student will develop a list of financial and community resources available to pregnant and parenting teens.

Financial and Community Resources Objectives
Students will:
0921.6.1 Identify and assess sources of support for pregnant and parenting teens and their families.
0921.6.2 Identify various parenting resources, and analyze current issues, trends, and research in parenting.
0921.6.3 Demonstrate how to access pregnancy/parenting information through the use of multi-media technology.
0921.6.4 Analyze current national, state and local statistics addressing sexual activity and develop future prevention strategies for the community

Standard 7: Career Development (0921.S.7)
The student will demonstrate the use of electronic technologies for planning and researching career goals.

Career Development Objectives
Students will:
0921.7.1 Set short-term and long-term personal, educational, and career goals.
0921.7.2 Develop a plan to achieve personal, educational, and career goals, and develop a plan to achieve those goals.
0921.7.3 Identify career options based on self-assessment and career assessment data.

0921.7.4 Investigate traditional and non-traditional jobs/careers for women.
0921.7.5 Access gender bias, sex-role stereotyping, and vocational sex equity for men and women.
0921.7.6 Analyze workplace sexual harassment, the laws and incidents of harassment.
0921.7.7 Identify job-seeking and job-keeping skills.

(Base) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0922.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0922.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0922.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0922.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0922.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0922.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0922.2.2 Identify factors affecting both positive and negative self-concept.
0922.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0922.2.4 Investigate, "Who am I."
0922.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0922.2.6 Distinguish good and poor traits of being a good friend.
0922.2.7 Formulate a plan to make yourself a good friend.
0922.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0922.2.10 Identify the relationship between children and parents.
0922.2.11 Define your individual family role.
0922.2.12 Investigate the importance of caring for children in a responsible way.
0922.2.13 Identify relationships between rights and responsibilities of family members.
0922.2.14 Identify family crisis situations and community sources of help.
0922.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0922.S.3)
The student will gain effective management skills.

Management Objectives
Students will:

0922.3.1 Explain the difference between an individual's wants and needs.
0922.3.2 Distinguish between an individual's basic physical and emotional needs.
0922.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0922.3.4 Describe different ways in which resources can be used.
0922.3.5 Describe values, goals and priorities.
0922.3.6 Relate the importance of values in making personal decisions.
0922.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0922.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0922.3.9 Identify the steps in the management process.
0922.3.10 Demonstrate how individuals can manage their time.
0922.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0922.3.12 Demonstrate how to make a budget.
0922.3.13 Research and give examples of how an individual can shop wisely.
0922.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0922.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:

0922.4.1 Give examples of how food is related to family traditions.
0922.4.2 Identify the many roles of food in the body.
0922.4.3 Identify those factors that influence eating habits.
0922.4.4 Differentiate between good and poor food choices.
0922.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0922.4.6 Using the food pyramid, plan daily menus for one week.
0922.4.7 Plan and complete assigned food labs.
0922.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0922.4.9 Identify good vs. bad health habits.
0922.4.10 Demonstrate good posture when standing, walking and sitting.
0922.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0922.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:

0922.5.1 Realize the importance of work in one's daily life.
0922.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0922.5.3 Identify factors which influence needs and wants in consumer choices.
0922.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0922.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0922.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0922.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0922.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0922.6.1 Identify factors affecting a positive personal image.
0922.6.2 Explore good personal grooming habits.
0922.6.3 Inventory personal wardrobe and analyze future clothing needs.
0922.6.4 Explain the difference between fads and fashion.
0922.6.5 Identify different fibers and fabrics.
0922.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0922.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0922.6.8 Identify and practice simple stain removal.
0922.6.9 Review sewing equipment.
0922.6.10 Review and practice minor clothing repairs.
0922.6.11 Complete a simple sewing project.
0922.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0922.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0922.7.1 Explain how housing meets the needs of family members.
0922.7.2 Evaluate types of housing.
0922.7.3 Analyze issues related to housing.
0922.7.4 Identify opportunities for volunteerism with regard to housing.
0922.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0922.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0922.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0922.8.1 Identify current and future work trends.
0922.8.2 Select and investigate one such work trend.
0922.8.3 Inventory future plans and abilities.
0922.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0922.8.5 Research a future career choice and prepare written report.
0922.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0922.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0922.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0922.9.1 Survey needs of local community.
0922.9.2 In conjunction with class members, review surveys and select a community project.

0922.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0922.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0922.10.1 Actively participate in the local FCCLA chapter.
0922.10.2 Investigate and complete a "Step One" project.
0922.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 5) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0923.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0923.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0923.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0923.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0923.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0923.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0923.2.2 Identify factors affecting both positive and negative self-concept.
0923.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0923.2.4 Investigate, "Who am I."
0923.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0923.2.6 Distinguish good and poor traits of being a good friend.
0923.2.7 Formulate a plan to make yourself a good friend.
0923.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0923.2.10 Identify the relationship between children and parents.
0923.2.11 Define your individual family role.
0923.2.12 Investigate the importance of caring for children in a responsible way.
0923.2.13 Identify relationships between rights and responsibilities of family members.
0923.2.14 Identify family crisis situations and community sources of help.
0923.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0923.S.3)
The student will gain effective management skills.

Management Objectives
Students will:

0923.3.1 Explain the difference between an individual's wants and needs.
0923.3.2 Distinguish between an individual's basic physical and emotional needs.
0923.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0923.3.4 Describe different ways in which resources can be used.
0923.3.5 Describe values, goals and priorities.
0923.3.6 Relate the importance of values in making personal decisions.
0923.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0923.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0923.3.9 Identify the steps in the management process.
0923.3.10 Demonstrate how individuals can manage their time.
0923.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0923.3.12 Demonstrate how to make a budget.
0923.3.13 Research and give examples of how an individual can shop wisely.
0923.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0923.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:

0923.4.1 Give examples of how food is related to family traditions.
0923.4.2 Identify the many roles of food in the body.
0923.4.3 Identify those factors that influence eating habits.
0923.4.4 Differentiate between good and poor food choices.
0923.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0923.4.6 Using the food pyramid, plan daily menus for one week.
0923.4.7 Plan and complete assigned food labs.
0923.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0923.4.9 Identify good vs. bad health habits.
0923.4.10 Demonstrate good posture when standing, walking and sitting.
0923.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0923.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:

0923.5.1 Realize the importance of work in one's daily life.
0923.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0923.5.3 Identify factors which influence needs and wants in consumer choices.
0923.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0923.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0923.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0923.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0923.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0923.6.1 Identify factors affecting a positive personal image.
0923.6.2 Explore good personal grooming habits.
0923.6.3 Inventory personal wardrobe and analyze future clothing needs.
0923.6.4 Explain the difference between fads and fashion.
0923.6.5 Identify different fibers and fabrics.
0923.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0923.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0923.6.8 Identify and practice simple stain removal.
0923.6.9 Review sewing equipment.
0923.6.10 Review and practice minor clothing repairs.
0923.6.11 Complete a simple sewing project.
0923.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0923.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0923.7.1 Explain how housing meets the needs of family members.
0923.7.2 Evaluate types of housing.
0923.7.3 Analyze issues related to housing.
0923.7.4 Identify opportunities for volunteerism with regard to housing.
0923.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0923.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0923.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0923.8.1 Identify current and future work trends.
0923.8.2 Select and investigate one such work trend.
0923.8.3 Inventory future plans and abilities.
0923.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0923.8.5 Research a future career choice and prepare written report.
0923.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0923.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0923.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0923.9.1 Survey needs of local community.
0923.9.2 In conjunction with class members, review surveys and select a community project.

0923.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0923.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0923.10.1 Actively participate in the local FCCLA chapter.
0923.10.2 Investigate and complete a "Step One" project.
0923.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 6) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

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Standard 1: Basic Skills (0924.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0924.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0924.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0924.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0924.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0924.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0924.2.2 Identify factors affecting both positive and negative self-concept.
0924.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0924.2.4 Investigate, "Who am I."
0924.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0924.2.6 Distinguish good and poor traits of being a good friend.
0924.2.7 Formulate a plan to make yourself a good friend.
0924.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0924.2.10 Identify the relationship between children and parents.
0924.2.11 Define your individual family role.
0924.2.12 Investigate the importance of caring for children in a responsible way.
0924.2.13 Identify relationships between rights and responsibilities of family members.
0924.2.14 Identify family crisis situations and community sources of help.
0924.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0924.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0924.3.1 Explain the difference between an individual's wants and needs.
0924.3.2 Distinguish between an individual's basic physical and emotional needs.
0924.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0924.3.4 Describe different ways in which resources can be used.
0924.3.5 Describe values, goals and priorities.
0924.3.6 Relate the importance of values in making personal decisions.
0924.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0924.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0924.3.9 Identify the steps in the management process.
0924.3.10 Demonstrate how individuals can manage their time.
0924.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0924.3.12 Demonstrate how to make a budget.
0924.3.13 Research and give examples of how an individual can shop wisely.
0924.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0924.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0924.4.1 Give examples of how food is related to family traditions.
0924.4.2 Identify the many roles of food in the body.
0924.4.3 Identify those factors that influence eating habits.
0924.4.4 Differentiate between good and poor food choices.
0924.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0924.4.6 Using the food pyramid, plan daily menus for one week.
0924.4.7 Plan and complete assigned food labs.
0924.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0924.4.9 Identify good vs. bad health habits.
0924.4.10 Demonstrate good posture when standing, walking and sitting.
0924.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0924.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0924.5.1 Realize the importance of work in one's daily life.
0924.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0924.5.3 Identify factors which influence needs and wants in consumer choices.
0924.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0924.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0924.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0924.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0924.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0924.6.1 Identify factors affecting a positive personal image.
0924.6.2 Explore good personal grooming habits.
0924.6.3 Inventory personal wardrobe and analyze future clothing needs.
0924.6.4 Explain the difference between fads and fashion.
0924.6.5 Identify different fibers and fabrics.
0924.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0924.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0924.6.8 Identify and practice simple stain removal.
0924.6.9 Review sewing equipment.
0924.6.10 Review and practice minor clothing repairs.
0924.6.11 Complete a simple sewing project.
0924.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0924.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0924.7.1 Explain how housing meets the needs of family members.
0924.7.2 Evaluate types of housing.
0924.7.3 Analyze issues related to housing.
0924.7.4 Identify opportunities for volunteerism with regard to housing.
0924.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0924.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0924.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0924.8.1 Identify current and future work trends.
0924.8.2 Select and investigate one such work trend.
0924.8.3 Inventory future plans and abilities.
0924.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0924.8.5 Research a future career choice and prepare written report.
0924.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0924.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0924.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0924.9.1 Survey needs of local community.
0924.9.2 In conjunction with class members, review surveys and select a community project.

0924.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0924.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0924.10.1 Actively participate in the local FCCLA chapter.
0924.10.2 Investigate and complete a "Step One" project.
0924.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 7) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

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Standard 1: Basic Skills (0925.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0925.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0925.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0925.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0925.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0925.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0925.2.2 Identify factors affecting both positive and negative self-concept.
0925.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0925.2.4 Investigate, "Who am I."
0925.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0925.2.6 Distinguish good and poor traits of being a good friend.
0925.2.7 Formulate a plan to make yourself a good friend.
0925.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0925.2.10 Identify the relationship between children and parents.
0925.2.11 Define your individual family role.
0925.2.12 Investigate the importance of caring for children in a responsible way.
0925.2.13 Identify relationships between rights and responsibilities of family members.
0925.2.14 Identify family crisis situations and community sources of help.
0925.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0925.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0925.3.1 Explain the difference between an individual's wants and needs.
0925.3.2 Distinguish between an individual's basic physical and emotional needs.
0925.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0925.3.4 Describe different ways in which resources can be used.
0925.3.5 Describe values, goals and priorities.
0925.3.6 Relate the importance of values in making personal decisions.
0925.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0925.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0925.3.9 Identify the steps in the management process.
0925.3.10 Demonstrate how individuals can manage their time.
0925.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0925.3.12 Demonstrate how to make a budget.
0925.3.13 Research and give examples of how an individual can shop wisely.
0925.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0925.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0925.4.1 Give examples of how food is related to family traditions.
0925.4.2 Identify the many roles of food in the body.
0925.4.3 Identify those factors that influence eating habits.
0925.4.4 Differentiate between good and poor food choices.
0925.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0925.4.6 Using the food pyramid, plan daily menus for one week.
0925.4.7 Plan and complete assigned food labs.
0925.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0925.4.9 Identify good vs. bad health habits.
0925.4.10 Demonstrate good posture when standing, walking and sitting.
0925.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0925.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0925.5.1 Realize the importance of work in one's daily life.
0925.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0925.5.3 Identify factors which influence needs and wants in consumer choices.
0925.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0925.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0925.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0925.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0925.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0925.6.1 Identify factors affecting a positive personal image.
0925.6.2 Explore good personal grooming habits.
0925.6.3 Inventory personal wardrobe and analyze future clothing needs.
0925.6.4 Explain the difference between fads and fashion.
0925.6.5 Identify different fibers and fabrics.
0925.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0925.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0925.6.8 Identify and practice simple stain removal.
0925.6.9 Review sewing equipment.
0925.6.10 Review and practice minor clothing repairs.
0925.6.11 Complete a simple sewing project.
0925.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0925.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0925.7.1 Explain how housing meets the needs of family members.
0925.7.2 Evaluate types of housing.
0925.7.3 Analyze issues related to housing.
0925.7.4 Identify opportunities for volunteerism with regard to housing.
0925.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0925.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0925.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0925.8.1 Identify current and future work trends.
0925.8.2 Select and investigate one such work trend.
0925.8.3 Inventory future plans and abilities.
0925.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0925.8.5 Research a future career choice and prepare written report.
0925.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0925.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0925.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0925.9.1 Survey needs of local community.
0925.9.2 In conjunction with class members, review surveys and select a community project.

0925.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0925.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0925.10.1 Actively participate in the local FCCLA chapter.
0925.10.2 Investigate and complete a "Step One" project.
0925.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

(Base 8) Basic Attitudes, Skills and Experiences

The student will focus on a variety of life skills and abilities that will assist their development of responsibility and self disciplined behaviors. The student will work through many decision making and problem solving situations in areas of career awareness, life style choices, community involvement, lifetime relationships, consumer skills, enhancing communication, managing one's health, leadership and citizenship.

BASE is designed to meet the unique needs of Family and Consumer Sciences (FACS) middle and junior high programs that have a wide variety of configurations. BASE is a very flexible curriculum that can meet the needs of various age groups and the wide variety of course lengths and school scheduling programs.

Standard 1: Basic Skills (0926.S.1)
The students will reinforce basic skills by completing daily BASE assignments.

Basic Skills Objectives
Students will:

0926.1.1 Enhance reading, writing and math skills through assigned FACS curriculum.
0926.1.2 Improve communication skills, both oral and written, through involvement in oral presentations and written reports relating to FACS curriculum.
0926.1.3 Investigate a variety of Human Services career goals.

Standard 2: Personal Development/Family Relationships (0926.S.2)
The student will work toward a positive self-identity and learn to relate to others.

Personal Development/Family Relationships Objectives
Students will:

0926.2.1 Explain how an individual's roles and personal traits influence the development of their self-concept.
0926.2.2 Identify factors affecting both positive and negative self-concept.
0926.2.3 Describe common development characteristics changes of early adolescents and how these changes influence an individual's self-concept.
0926.2.4 Investigate, "Who am I."
0926.2.5 Use problem-solving and decision making techniques in coping with assigned adolescent problems.
0926.2.6 Distinguish good and poor traits of being a good friend.
0926.2.7 Formulate a plan to make yourself a good friend.
0926.2.8 Define family, generation, affection, and respect for others.
0922.2.9 Demonstrate the different family roles individuals play across their life span.
0926.2.10 Identify the relationship between children and parents.
0926.2.11 Define your individual family role.
0926.2.12 Investigate the importance of caring for children in a responsible way.
0926.2.13 Identify relationships between rights and responsibilities of family members.
0926.2.14 Identify family crisis situations and community sources of help.
0926.2.15 Describe the effect of social problems on the individual, family and society.

Standard 3: Management (0926.S.3)
The student will gain effective management skills.

Management Objectives
Students will:
0926.3.1 Explain the difference between an individual's wants and needs.
0926.3.2 Distinguish between an individual's basic physical and emotional needs.
0926.3.3 Define resources, human resources, nonhuman resources, private resources, public resources and scarce resources.
0926.3.4 Describe different ways in which resources can be used.
0926.3.5 Describe values, goals and priorities.
0926.3.6 Relate the importance of values in making personal decisions.
0926.3.7 Identify goals, rank goals, and determine ways in which resources can help one reach these goals.
0926.3.8 Define management, management process, schedule, implement, evaluate, time management, habit and procrastinate.
0926.3.9 Identify the steps in the management process.
0926.3.10 Demonstrate how individuals can manage their time.
0926.3.11 Identify income, money management, budget, fixed expenses, flexible expenses, consumer, unit price, quality and warranty.
0926.3.12 Demonstrate how to make a budget.
0926.3.13 Research and give examples of how an individual can shop wisely.
0926.3.14 Determine how personal and shared space and property can be used effectively.

Standard 4: Nutrition and Wellness (0926.S.4)
The student will analyze the effects of nutrition on wellness.

Nutrition and Wellness Objectives
Students will:
0926.4.1 Give examples of how food is related to family traditions.
0926.4.2 Identify the many roles of food in the body.
0926.4.3 Identify those factors that influence eating habits.
0926.4.4 Differentiate between good and poor food choices.
0926.4.5 Investigate the relationship between food consumption, weight management, health physical performance and appearance.
0926.4.6 Using the food pyramid, plan daily menus for one week.
0926.4.7 Plan and complete assigned food labs.
0926.4.8 Demonstrate safety, sanitation, self-sufficiency and teamwork in the foods laboratory.
0926.4.9 Identify good vs. bad health habits.
0926.4.10 Demonstrate good posture when standing, walking and sitting.
0926.4.11 Relate the effects of nutrition, rest, and exercise on an individual's health and appearance.

Standard 5: Consumer Education (0926.S.5)
The student will gain knowledge of human economics and environmental resources that will enable them to work toward becoming self-sufficient adults.

Consumer Education Objectives
Students will:
0926.5.1 Realize the importance of work in one's daily life.
0926.5.2 Define consumer decisions, mass media, advertising, and impulse buying.
0926.5.3 Identify factors which influence needs and wants in consumer choices.
0926.5.4 Give examples of how peers, mass media and advertising can affect what an individual buys.
0926.5.5 Demonstrate skills that ensure consumer rights/responsibilities.
0926.5.6 Relate income to spending and recognize factors that influence price, quality and consumer services.

0926.5.7 Demonstrate awareness of the computer and its varied uses in consumer awareness.

Standard 6: Textiles and Apparel (0926.S.6)
The student will develop knowledge in selecting and caring for their wardrobe.

Textiles and Apparel Objectives
Students will:
0926.6.1 Identify factors affecting a positive personal image.
0926.6.2 Explore good personal grooming habits.
0926.6.3 Inventory personal wardrobe and analyze future clothing needs.
0926.6.4 Explain the difference between fads and fashion.
0926.6.5 Identify different fibers and fabrics.
0926.6.6 Demonstrate reading hangtags, labels and inspecting garment construction before buying.
0926.6.7 Develop routine habits for daily, weekly, and seasonal care of clothing.
0926.6.8 Identify and practice simple stain removal.
0926.6.9 Review sewing equipment.
0926.6.10 Review and practice minor clothing repairs.
0926.6.11 Complete a simple sewing project.
0926.6.12 Explore a career in the textile and apparel industry.

Standard 7: Housing, Interior and Furnishings (0926.S.7)
The student will explore personal living space.

Housing, Interior and Furnishings Objectives
Students will:
0926.7.1 Explain how housing meets the needs of family members.
0926.7.2 Evaluate types of housing.
0926.7.3 Analyze issues related to housing.
0926.7.4 Identify opportunities for volunteerism with regard to housing.
0926.7.5 Analyze career paths within the housing, interiors and furnishing industry.
0926.7.6 Plan and develop a one-room apartment design/model.

Standard 8: Career Awareness (0926.S.8)
The student will begin investigating their future career choices.

Career Awareness Objectives
Students will:
0926.8.1 Identify current and future work trends.
0926.8.2 Select and investigate one such work trend.
0926.8.3 Inventory future plans and abilities.
0926.8.4 Set goals for 1 year, 2 years and 5 years toward a future career.
0926.8.5 Research a future career choice and prepare written report.
0926.8.6 Recognize personal qualities and characteristics and how they influence occupational choices.
0926.8.7 Identify and describe personal traits that lead to success.

Standard 9: Community Involvement (0926.S.9)
The student will learn of community needs and how to be a productive member of the community.

Community Involvement Objectives
Students will:
0926.9.1 Survey needs of local community.
0926.9.2 In conjunction with class members, review surveys and select a community project.

0926.9.3 Using the "Planning Process", identify, plan, implement and evaluate the selected project.

Standard 10: FCCLA (0926.S.10)
The student will investigate the opportunities available through a national student organization.

FCCLA Objectives
Students will:
0926.10.1 Actively participate in the local FCCLA chapter.
0926.10.2 Investigate and complete a "Step One" project.
0926.10.3 Actively use the "Planning Process" to plan and implement local chapter projects.

Community and Human Services

The student will learn to integrate multiple life roles and responsibilities in family, work and community settings.

Standard 1: Factors Influencing Community Life. (0927.S.1)
The student will examine multiple factors that influence individual, family and community life.

Community Life Objectives
Students will:

0927.1.1 Analyze strategies to manage multiple individual, family, career, and community roles and responsibilities.
0927.1.2 Examine policies, issues, and trends in the workplace and community that impact individuals and families.
0927.1.3 Analyze the impact of social, economic, and technological change on work and family dynamics.
0927.1.4 Analyze ways that individual career goals can enhance the family's capacity to meet goals for all family members.
0927.1.5 Analyze the potential impact of career path decisions on balancing work and family.
0927.1.6 Determine goals for life-long learning and leisure opportunities for all family members.
0927.1.7 Determine skills and knowledge needed to develop a life plan for achieving individual, family and career goals.

Standard 2: Community and Workplace Required Settings. (0927.S.2)
The student will demonstrate skills needed in community and workplace settings.

Required Settings Objectives
Students will:

0927.2.1 Examine potential career choices to determine the knowledge, skills, and attitudes associated with each.
0927.2.2 Demonstrate job seeking and job keeping skills.
0927.2.3 Apply communication skills in community and workplace settings.
0927.2.4 Demonstrate teamwork skills in community and workplace settings.
0927.2.5 Examine strategies to manage the impact of changing technologies in workplace settings.
0927.2.6 Demonstrate leadership skills and abilities in the workplace and community.
0927.2.7 Examine factors that contribute to maintaining safe and healthy work and community environments.
09272.8 Demonstrate work ethics and professionalism.

Standard 3: Community and Civic Responsibilities (0927.S.3)
The student will analyze the reciprocal impact of individual and family participation in community activities.

Community and Civic Responsibilities Objectives
Students will:

0927.3.1 Examine goals that support individuals and family members in carrying out community and civic responsibilities.
0927.3.2 Arrange a plan for individuals and families to select and develop skills in community activities.
0927.3.3 Determine skills that provide beneficial services to the community.
0927.3.4 Examine community resources and systems of formal and informal support available to individuals and families.
09273.5 Examine the impact of public policies, agencies, and institutions on the family.

Human Services, Development and Relationships

This course will promote student growth and development of self and others by providing students with the skills to develop respectful and responsible relationships within their family, career and community.

Standard 1: Growth and Development (0928.S.1)
The student will analyze growth and development of self and others across the life span.

Growth and Development Objectives
Students will:
0928.1.1 Analyze human growth and development across the life span/life cycle.
0928.1.2 Explain principles of human growth and development.
0928.1.3 Examine major historical and current human development theories to interpret human development.
0928.1.4 Examine the basic human needs and patterns that influence individual development.
0928.1.5 Explain factors that shape human development from preconception through aging.
0928.1.6 Determine the impact of social, economic and technological forces.
0928.1.7 Explain the effect of gender, ethnicity, and culture on individual development.

Standard 2: Environment and Personal Forces (0928.S.2)
The student will assess environmental and personal forces that impact growth and development.

Environment and Personal Forces Objectives
The students will:
0928.2.1 Consider the influence of personality, temperament, and experience on learning and development.
0928.2.2 Investigate the interrelationship of physical, emotional, social, and intellectual development across the life span.
0928.2.3 Investigate the impact of heredity and family on human growth and development.
0928.2.4 Assess the effects of environment and community on human growth and development.
0928.2.5 Explain the effect of life events and conditions on individuals' physical and emotional development.
0928.2.6 Analyze family development and change across time and cultures.

Standard 3: Interpersonal Relationships (0928.S.3)
The student will analyze influences that affect interpersonal relationships.

Interpersonal Relationships Objectives
The students will:
0928.3.1 Review functions and expectations of various types of relationships.
0928.3.2 Determine factors contributing to healthy and unhealthy relationships.
0928.3.3 Assess processes for handling unhealthy relationships.
0928.3.4 Appraise the impact of life events and conditions on relationships.
0928.3.5 Assess the effect the various stages of the life span have on relationships.
0928.3.6 Examine the effect of personal needs on relationships.
0928.3.7 Determine the processes for building and maintaining respectful, responsible relationships.
0928.3.8 Explain how self-esteem and self-image affect relationships with others.
0928.3.9 Compare physical, emotional, and intellectual responses to stable versus unstable relationships.
0928.3.10 Demonstrate leadership skills and abilities reflecting the democratic process in the family, workplace, and community.
0928.3.11 Examine the impact of leadership skills, abilities, and styles on collaborative group Actions.

Standard 4: Relationships Skills (0928.S.4)
The student will demonstrate skills for forming respectful and responsible relationships.

Relationships Skills Objectives
Students will:
0928.4.1 Demonstrate leadership skills to support group members and achieve group goals.
0928.4.2 Establish guidelines for leading small groups in the family.
0928.4.3 Examine the strengths and limitations of team members.
0928.4.4 Determine communication principles and patterns that affect human growth and development.
0928.4.5 Examine communication styles and their effects on relationships.
0928.4.6 Examine factors that affect messages communicated to others.
0928.4.7 Examine types of verbal and nonverbal communication.
0928.4.8 Demonstrate active and reflective listening.
0928.4.9 Describe attitudes and behaviors that foster effective communication.
0928.4.10 Examine communication barriers.
0928.4.11 Demonstrate constructive feedback techniques.
0928.4.12 Apply ethical principles in communication.

Standard 5: Healthy Lifestyles Behaviors (0928.S.5)
The student will evaluate behaviors that promote healthy lifestyles.

Healthy Lifestyles Behaviors Objectives
Students will:
0928.5.1 Examine nurturing practices that support development across the life span.
0928.5.2 Assess available support systems that meet human needs.
0928.5.3 Determine the impact of empathy on relationships.
0928.5.4 Demonstrate awareness of diversity and tolerance and their impact on relationships.
0928.5.5 Analyze the consequences of making generalizations about cultural groups.
0928.5.6 Investigate causes of conflict.
0928.5.7 Demonstrate effective conflict prevention and management techniques.
0928.5.8 Determine the role of decision making and problem solving in reducing and managing conflict.
0928.5.9 Demonstrate nonviolent strategies to address conflict.
0928.5.10 Locate community resources that support conflict prevention and management.
0928.5.11 Determine physical, emotional, and intellectual responses to threat.
0928.5.12 Examine types of standards for making judgments related to personal and family relationships.
0928.5.13 Demonstrate ethical behaviors in family, workplace, and community.
0928.5.14 Manage factors contributing to stress.
0928.5.15 Determine symptoms of stress on self, relationships, and work productivity.
0928.5.16 Evaluate strategies for copying with stress.
0928.5.17 Identify situations that require crisis intervention.

Standard 6: Human Services Careers (0928.S.6)
The student will evaluate career options and opportunities in human services.

Human Services Careers Objectives
Students will:
0928.6.1 Examine personal ethical standards.
0928.6.2 Demonstrate transferable employability skills, in relation to individual, family, community, and career roles.
0928.6.3 Analyze technologies and their relationships to managing individual, family, career, and community roles and responsibilities.

0928.6.4 Analyze issues related to the workplace and community, and discuss how these may be addressed by individuals and communities.
0928.6.5 Determine practices that allow families to maintain economic self-sufficiency.
0928.6.6 Research entrepreneurial opportunities related to these careers.

Surviving Today's Experiences and Problems Successfully (STEPS)

Through this year long course the student will develop skills to function successfully within their current family and peer groups. By utilizing basic skills and higher order thinking skill the student will learn management problem techniques, to care for children, nutrition/foods, consumer education, person/family relationships, and clothing and textiles.

Standard 1: Basic Academic Skills (0929.S.1)
The student will reinforce basic academic skills that are integrated throughout the FACS curriculum.

Basic Academic Skills Objectives
Students will:
0929.1.1 Advance reading, writing and math skills through completion of the STEP curriculum assignments.
0929.1.2 Improve communicating skills, both oral and written, through involvement in oral presentations and written reports relating to the STEP curriculum.
0929.1.3 Investigate a variety of Human Services careers.

Standard 2: FCCLA (0929.S.2)
The student will develop a fundamental vision of FCCLA (Family, Career, and Community Leaders of America) at the state and national levels, while participating at the local level.

FCCLA Objectives
Students will:
0929.2.1 Explore FCCLA state and national projects.
0929.2.2 Participate in an FCCLA meetings using basic parliamentary procedure.
0929.2.3 Explain and actively participate in an activity using the steps in the FCCLA planning process to plan local projects.

Standard 3: Careers in Management (0929.S.3)
The student will identify careers in management.

Careers in Management Objectives
Students will:
0929.3.1 Explore opportunities for careers in management.

Standard 4: Personal Resources (0929.S.4)
The student will plan and evaluate use of personal resources.

Personal Resources Objectives
Students will:
0929.4.1 Explore concerns teens have about management.
0929.4.2 Analyze the management process.
0929.4.3 Assess personal values and goals and explain personal responsibilities for setting and reaching goals.
0929.4.4 Determine how resources can be used to reach goals and identify personal resources.
0929.4.5 Review organizational procedures which save time and effort.
0929.4.6 Demonstrate a plan for use of personal time based on personal goals, values and standards.
0929.4.7 Explain reasons management is important in the workplace.

Standard 5: Conservation of Natural Resources (0929.S.5)
The student will identify ways teens can take responsibility for conserving natural resources.

Conservation of Natural Resources Objectives
Students will:
0929.5.1 Identify environmental concerns in the home, the community, the nation and the world.
0929.5.2 Propose a solution to an environmental problem, make a plan and take action.

Standard 6: Child Care and Development Careers (0929.S.6)
The student will identify characteristics of jobs related to childcare and development.

Child Care and Development Careers Objectives
Students will:
0929.6.1 Analyze the role of a babysitter and devise a plan for beginning a babysitting business.
0929.6.2 Describe characteristics of career opportunities related to childcare and development.

Standard 7: Child Care (0929.S.7)
The student will approach problems related to caring for children's play, food, guidance, and safety needs.

Child Care Objectives
Students will:
0929.7.1 Establish goals for meeting children's needs.
0929.7.2 Demonstrate ways teens can help meet the care and safety needs of children.
0929.7.3 Devise ways to care for the needs of infants, toddlers and preschoolers.
0929.7.4 Demonstrate activities and techniques that stimulate children's development.

Standard 8: Careers in Nutrition and Foods
The student will examine career choices related to nutrition and foods.

Careers in Nutrition and Foods Objectives (0929.)
Students will:
0929.8.1 Explore employment opportunities and requirements in nutrition/foods.

Standard 9: Nutrition and Foods (0929.S.9)
The student will exhibit procedures for working in the foods lab in an accurate, safe and sanitary manner and practice etiquette.

Nutrition and Foods Objectives
Students will:
0929.9.1 Determine safe and sanitary ways to prepare, serve, and store food.
0929.9.2 Explain the functions and use of cooking equipment.
0929.9.3 Plan for cooperation in the lab.
0929.9.4 Demonstrate accurate measurement of food preparation ingredients.
0929.9.5 Demonstrate appropriate and courteous table manners.

Standard 10: Nutrition and Wellness (0929.S.10)
The student will determine ways to meet food and nutrition goals and to solve individual nutrition issues.

Nutrition and Wellness Objectives
Students will:
0929.10.1 Identify common nutrition/food concerns of teens.
0929.10.2 Analyze factors affecting teen food choices and assess personal food habits.
0929.10.3 Formulate nutrition goals which lead to wellness, based on current guidelines for meeting nutrition needs.
0929.10.4 Evaluate sources of nutrition information.

0929.10.5 Examine alternatives for providing weekly food intake which meets wellness goals.

Standard 11: Teen Nutrition Concerns and Issues (0929.S.11)
The student will analyze alternative solutions to teen nutrition issues.

Teen Nutrition Concerns and Issues Objectives
Students will:
0929.11.1 Explain consequences of alternatives related to various nutrition issues and make judgments about appropriate courses of action.

Standard 12: Careers in Money Management and Consumer Economics (0929.S.12)
The student will identify career opportunities in money management and consumer economics.

Careers in Money Management and Consumer Economics Objectives
Students will:
0929.12.1 Describe career opportunities in money management and consumer economics.

Standard 13: Analyze Strategies (0929.S.13)
The student will analyze strategies used by sellers and plan consumer strategies which maximize resource use.

Analyze Strategies Objectives
Students will:
0929.13.1 Determine products and services commonly purchased by teens.
0929.13.2 Explore needs, wants and values common to teens and tell how these affect consumer decisions.
0929.13.3 Demonstrate strategies used by sellers to increase sales and provide product information.
0929.13.4 Exhibit buymanship skills useful in managing resources.
0929.13.5 Compare consumer rights with consumer responsibilities, cite ways laws protect consumers and identify other sources of consumer information.
0929.13.6 Explain ways ecological needs affect consumer goals and plan ways to promote ecology through purchasing.

Standard 14: Financial Planning (0929.S.14)
The student will determine ways to plan financial resource use.

Financial Planning Objectives
Students will:
0929.14.1 Identify teen money management concerns.
0929.14.2 Explain how the availability of human, material, and time resources affect consumer decisions.
0929.14.3 Weigh the alternatives for obtaining income as a teen.
0929.14.4 Identify personal expenditure needs throughout high school.
0929.14.5 Make a plan for personal income, expenses and savings.
0929.14.6 Given teen money management problems, weigh alternatives and suggest a course of action.

Standard 15: Careers in Personal and Family Relationships. (0929.S.15)
The student will analyze career choices in personal and family relationships.

Careers in Personal and Family Relationships Objectives
Students will:
0929.15.1 Research careers related to personal and family relationships.
0929.15.2 Analyze the effect of relationship skills on job success.

Standard 16: Relationships Formulation (0929.S.16)
The student will analyze relationship skills which form the basis for all relationships.

Relationships Formulation Objectives
Students will:
0929.16.1 Identify personal concerns regarding building and maintaining relationships.
0929.16.2 Analyze ways to form a more realistic self-concept and to build self-esteem.
0929.16.3 Demonstrate verbal and non-verbal communication that enhances relationships.
0929.16.4 Explain skills that are important in developing good relationships with other persons.

Standard 17: Personal Relationships (0929.S.17)
The student will suggest solutions for problems related to friendship and dating.

Personal Relationships Objectives
Students will:
0929.17.1 Summarize characteristics which build lasting friendships.
0929.17.2 Compare dating and friendship.
0929.17.3 Analyze problems related to friendships and dating, suggest solutions and evaluate suggestions.

Standard 18: Family Problems (0929.S.18)
The student will analyze family relationship problems and suggest a course of action.

Family Problems Objectives
Students will:
0929.18.1 Identify common family relationship concerns of teens.
0929.18.2 Describe ways family forms may differ throughout the family life cycle.
0929.18.3 Explain the functions of a family to its members and to society.
0929.18.4 Explain factors which affect relationships in families.
0929.18.5 Plan ways family members can share and exchange roles within a family.
0929.18.6 Given problem situations, suggest solutions and evaluate.

Standard 19: Career Relating to Teen Issues (0929.S.19)
The student will identify career opportunities related to teen issues.

Career Relating to Teen Issues Objectives
Students will:
0929.19.1 Investigate job opportunities related to teen issues and steps teens can take to control their career futures.

Standard 20: Teen Issues (0929.S.20)
The student will analyze teen issues and suggest solutions for problems experienced by teens.

Teen Issues Objectives
Students will:
0929.20.1 Analyze teen independence/interdependence and explain the meaning of "taking control of life."
0929.20.2 Analyze alternatives for coping with teen issues.
0929.20.3 Analyze issues affecting teens to determine nature, symptoms and effects of issues and suggest alternatives for coping with the issues.
0929.20.4 Given examples of problems related to teen issues, suggest a solution and justify the choice.

Standard 21: Careers in Clothing/Textiles (0929.S.21)
The student will identify career options in clothing/textiles.

Careers in Clothing/Textiles Objectives
Students will:
0929.21.1 Determine career opportunities in clothing and textiles.

Standard 22: Clothing and Textiles (0929.S.22)
The student will develop knowledge in selecting and caring for their wardrobe.

Clothing and Textiles Objectives
Students will:
0929.22.1 Explain clothing concerns of teens.
0929.22.2 Identify motivations for clothing selection.
0929.22.3 Examine personal clothing goals.
0929.22.4 Given clothing selection situations, make judgments based on source, quality and fabric.
0929.22.5 Construct a simple project using accepted practice for equipment use and construction techniques.
0929.22.6 Practice procedures for storing and repairing clothing which promote a neat appearance and longer clothing use.
0929.22.7 Given clothing labels, determine the type of cleaning needed.
0929.22.8 Determine laundry procedures and describe ways family members can share laundry responsibilities.

Applied Design-Housing/Interior Design

This course will provide students with the skills and practices that are required for the application of design elements and principles in the areas of housing.

Standard 1: Design Elements and Principles (0941.S.1)
The student will pursue the knowledge, skill and practices required for the application of design elements and principles in the areas of housing.

Design Elements and Principles Objectives
Students will:
0941.1.1 Determine and apply the elements and principles of design.
0941.1.2 Analyze the effects that elements and principles of design have on aesthetics and function.
0941.1.3 Predict the psychological impact that the principles and elements have on individuals and families.
0941.1.4 Demonstrate knowledge of cultural influences upon design.
0941.1.5 Explore the use of current technology to facilitate design.
0941.1.6 Use a variety of equipment, tools, supplies, and techniques in the design process.
0941.1.7 Demonstrate design skills.
0941.1.8 Demonstrate design ideas through visual presentations.

Standard 2: Customer Service/Business Profitability (0941.S.2)
The student will be able to demonstrate "Customer Service/Business Profitability.

Customer Service/Business Profitability Objectives
Students will:
0941.2.1 Demonstrate effective communication skills.
0941.2.2 Evaluate the components of customer service.
0941.2.3 Analyze the merchandising of design products.
0941.2.4 Examine responsibilities, liabilities, and legislation related to safety, security, and environmental factors.

Standard 3: Textiles (0941.S.3)
The student will explore the many areas of textiles

Textiles Objectives
Students will:
0941.3.1 Identify, compare, and analyze the most common textile fibers.
0941.3.2 Predict the effects of textile characteristics on design, construction and use.
0941.3.3 Select appropriate procedures for care and maintenance of textile products/apparel.
0941.3.4 Examine textile legislation, standards, and labeling in the global economy.
0941.3.5 Demonstrate textile design skill.
0941.3.6 Evaluate career paths within the textile industry.

Standard 4: Housing/Interior Design (0941.S.4)
The student will examine the many areas of Housing/Interior Design.

Housing/Interior Design Objectives
Students will:
0941.4.1 Evaluate career paths within the interior design, housing, and home furnishings industry.
0941.4.2 Evaluate the needs, goals, and resources in creating design plans and/or acquiring housing.
0941.4.3 Analyze influences on architectural and furniture design and development.
0941.4.4 Evaluate the use of housing and interiors furnishings and products to relate to

specific design needs.

0941.4.5 Demonstrate the use of technology and other skills required for the housing, interiors and furnishings industry.

0941.4.6 Analyze major components of a home's structure.

0941.4.7 Evaluate exterior and interior materials and products used in construction.

Food Preparation

The student will focus on various food preparation and management skills that promotes health and wellness of individuals and families.

Standard 1: Safety, Sanitation & Storage (0951.S.1)
The student will demonstrate safety, sanitation and food storage procedures.

Safety, Sanitation & Storage Objectives
Students will:
0951.1.1 Practice acceptable personal hygiene.
0951.1.2 Analyze food-borne illnesses.
0951.1.3 Identify and use proper sanitation habits and safety/first-aid procedures in food preparation and storage.

Standard 2: Abbreviations and Equivalents (0951.S.2)
The student will identify and interpret food preparation abbreviations and equivalents.

Abbreviations and Equivalents Objectives
Students will:
0951.2.1 Identify and correctly use abbreviations found in recipes.
0951.2.2 Identify and correctly use math equivalents and symbols common to food preparation.
0951.2.3 Determine the correct equivalents to use when manipulating recipe amounts.
0951.2.4 List kinds of information a good recipe contain.
0951.2.5 Analyze effects of increasing/decreasing a recipes yield.
0951.2.6 Examine how high altitude affects the cooking process.

Standard 3: Terms (0951.S.3)
The student will identify food preparation terms.

Terms Objectives
Students will:
0951.3.1 Identify and define food preparation terms and cookery techniques terms.
0951.3.2 Describe the importance of implementing correct food preparation terms and cookery techniques terms to successful recipe interpretation.
0951.3.3 Demonstrate assigned food preparation and techniques skills.

Standard 4: Measuring and Mixing (0951.S.4)
The student will develop correct measuring techniques.

Measuring and Mixing Objectives
Students will:
0951.4.1 Identify standard units of measure used in food preparation.
0951.4.2 Use correct math common to food preparation when translating recipes.
0951.4.3 Identify and demonstrate the correct measuring equipment for both liquid and dry ingredients.
0951.4.4 Evaluate the importance of exact measurements of ingredients when cooking and baking.

Standard 5: Equipment (0951.S.5)
The student will identify large and small food preparation equipment.

Equipment Objectives
Students will:
0951.5.1 Recognize large and small kitchen equipment.
0951.5.2 Demonstrate safe use and care of all kitchen equipment.
0951.5.3 Identify, select, use and care for equipment used in the preparation of food.

0951.5.4 Improvise for equipment that is not available.
0951.5.5 Compare microwave cooking to conventional cooking.
0951.5.6 Demonstrate safety precautions and care for microwave oven usage.
0951.5.7 Analyze cooking techniques and utensils used for successful microwave cooking.
0951.5.8 Identify factors affecting microwave cooking time.

Standard 6: Utensils (0951.S.6)
The student will identify kitchen utensils.

Utensils Objectives
Students will:
0951.6.1 Identify small kitchen utensils, their uses and care.
0951.6.2 Demonstrate proper use and care of small kitchen utensils in preparation of assigned recipes.

Standard 7: Table Setting and Etiquette (0951.S.7)
The student will practice table setting and etiquette.

Table Setting and Etiquette Objectives
Students will:
0951.7.1 Research table etiquette guidelines.
0951.7.2 Research table etiquette guidelines for different ethnical groups.
0951.7.3 Demonstrate table settings for various types of meals.
0951.7.4 Practice good table manners during food preparations labs.

Standard 8: Nutrition (0951.S.8)
The student will analyze good nutrition practices.

Nutrition Objectives
Students will:
0951.8.1 Identify factors affecting an individual's nutritional needs.
0951.8.2 Relate the role of good nutrition to the health and wellness of individuals and families.
0951.8.3 Demonstrate how to conserve nutrients during food preparation.
0951.8.4 Develop a one-week menu for a family of four using the food pyramid.
0951.8.5 Research diet disorders, (i.e. bulimia, anorexia.)
0951.8.6 Analyze special needs diets, (i.e. diabetic, vegetarian, low cholesterol, etc.)

Standard 9: Cooking Labs (0951.S.9)
The student will apply food preparation techniques and skills.

Cooking Labs Objectives
Students will:
0951.9.1 Develop appropriate menus, grocery orders and timelines for cooking and/or baking labs.
0951.9.2 Prepare and compare six types of cookies.
0951.9.3 Describe the functions of ingredients, nutritive value, and methods of preparation.
0951.9.4 Evaluate products by appearance and eating quality.
0951.9.5 Interpret general information about quick breads and methods of preparation.
0951.9.6 Prepare the following quick breads: biscuits, muffins, pancakes, and loaf breads.
0951.9.7 Evaluate how ingredients function in different products.
0951.9.8 Explain the grading of eggs.
0951.9.9 Draw and label the structure of eggs.
0951.9.10 Describe the functions of eggs in food preparation.
0951.9.11 Prepare fruits and vegetables recipes.
0951.9.12 Prepare dairy products and egg recipes.
0951.9.13 Prepare pasta and potato products recipes.
0951.9.14 Prepare Garde Manger items.
0951.9.15 Supervise kitchen staff as a head cook.

0951.9.16 Classify and choose spices, herbs, and extracts to enhance the flavors in foods.
0951.9.17 Select, prepare, and serve a dish of the students' choice.

Nutrition and Food Science

Nutrition courses focus on the value of good nutrition in relationship to wellness. Students use scientific processes to study the field of food science. Laboratory skills and experimental methods are used to measure, record and analyze data that relate to the relationship of food science to other sciences (such as chemistry, microbiology, nutrition and physics).

Standard 1: Nutritional Content
The student will evaluate the nutritional content of food to promote individual and family wellness across the life span.

Nutritional Content Objectives
Students will:
0952.1.1 Evaluate the nutritional content of food in relation to the health and wellness needs of individuals and families.
0952.1.2 Using technology, analyze personal eating habits and plan ways to choose food to meet nutritional goals.
0952.1.3 Identify factors, facts, and fallacies that affect wellness.
0952.1.4 Evaluate the use of supplements to meet daily nutritional needs.

Standard 2: Six Basic Nutrients (0952.S.2)
The student will interpret information regarding the six basic nutrients to promote health and wellness.

Six Basic Nutrients Objectives
Students will:
0952.2.1 Identify the functions, food sources, and excess/inadequate amounts of the six major nutrients.
0952.2.2 Explain the process of food digestion and nutrient absorption.
0952.2.3 Examine the properties of each of the six basic nutrients.

Standard 3: Food Preparation Techniques (0952.S.3)
The student will demonstrate planning, selecting, storing, preparing and serving of foods to meet nutritional needs of individuals and families across the life span.

Food Preparation Techniques Objectives
Students will:
0952.3.1 Compare food purchasing options according to cost and nutritional quality.
0952.3.2 Identify meal planning strategies for different stages of the family life cycle.
0952.3.3 Plan, prepare, and store food to achieve nutritional goals.
0952.3.4 Explain how to choose and handle food to preserve nutrition, quality, and safety.
0952.3.5 Explore techniques of food preservation.

Standard 4: Food Safety (0952.S.4)
The student will demonstrate food safety and sanitation practices for handling food.

Food Safety Objectives
Students will:
0952.4.1 Identify potential health problems related to food supply.
0952.4.2 Identify sanitary and food handling practices that can help prevent food spoilage.
0952.4.3 Describe the properties of the microorganisms that cause food spoilage.
0952.4.4 Describe safety guidelines.

Standard 5: Nutritional Factors (0952.S.5)
The student will analyze the internal and external factors that influence nutritional practices and wellness across the life span.

Nutritional Factors Objectives
Students will:
0952.5.1 Examine the nutritional needs and food patterns of various age groups.
0952.5.2 Research nutrition and the athlete.
0952.5.3 Research specialty diets (vegetarian, diabetic, fad diets, etc.).
0952.5.4 Describe how food choices are influenced by available resources and technology.

Standard 6: Product Labels (0952.S.6)
The student will analyze information on product labels.

Product Labels Objectives
Students will:
0952.6.1 Compare foods as to nutritional content and serving size.
0952.6.2 Examine and interpret food labels.

Standard 7: Food Trends (0952.S.7)
The student will analyze behaviors and food industry trends.

Food Trends Objectives
Students will:
0952.7.1 Describe techniques for successful weight control methods.
0952.7.2 Analyze effects of eating disorders.
0952.7.3 Research solutions to reduce calories, increase fiber, reduce sugar, reduce fat, increase complex carbohydrates, etc.
0952.7.4 Identify practical ways to change eating habits.
0952.7.5 Evaluate the use of supplements to meet daily nutritional needs.
0952.7.6 Analyze the metabolic process.
0952.7.7 Examine the issue of diet versus disease prevention (birth defects, cardiovascular, hypertension, etc.)

Standard 8: Food Science Concepts (0952.S.8)
The student will apply the steps in the scientific method to examine basic food science concepts.

Food Science Concepts Objectives
Students will:
0952.8.1 Identify scientific equipment used in the food science industry.
0952.8.2 Explain the steps in the scientific method.
0952.8.3 Write accurate and complete reports of food science experiments.
0952.8.4 Identify basic science concepts.
0952.8.5 Explore basic energy concepts.
0952.8.6 Examine acid and bases.
0952.8.7 Explore experimentation in food science.

Standard 9: Food Science Careers (0952.S.9)
The student will research careers in the nutrition and food science areas.

Food Science Careers Objectives
Students will:
0952.9.1 Identify entry level and advanced level careers in nutrition and food sciences.
0952.9.2 Examine education and training needed for a career in nutrition and food science.
0952.9.3 Explore emerging careers in nutrition, food science, and biotechnology.

Applied Design-Fashion Merchandising

This course will provide students with the skills and practices that are required for the application of design elements and principles in the areas of fashion.

Standard 1: Design Elements and Principles (0961.S.1)
The student will pursue the knowledge, skill and practices required for the application of design elements and principles in the areas of fashion.

Design Elements and Principles Objectives
Students will:
0961.1.1 Determine and apply the elements and principles of design.
0961.1.2 Analyze the effects that elements and principles of design have on aesthetics and function.
0961.1.3 Predict the psychological impact that the principles and elements have on individuals and families.
0961.1.4 Demonstrate knowledge of cultural influences upon design.
0961.1.5 Explore the use of current technology to facilitate design.
0961.1.6 Use a variety of equipment, tools, supplies, and techniques in the design process.
0961.1.7 Demonstrate design skills.
0961.1.8 Demonstrate design ideas through visual presentations.

Standard 2: Customer Service/Business Profitability (0961.S.2)
The student will demonstrate customer service and business profitability skills.

Customer Service/Business Profitability Objectives
Students will:
0961.2.1 Demonstrate effective communication skills.
0961.2.2 Evaluate the components of customer service.
0961.2.3 Analyze the merchandising of design products.
0961.2.4 Examine responsibilities, liabilities, and legislation related to safety, security, and environmental factors.

Standard 3: Textiles (0961.S.3)
The student will explore the many areas of textiles.

Textiles Objectives
Students will:
0961.3.1 Identify, compare, and analyze the most common textile fibers.
0961.3.2 Predict the effects of textile characteristics on design, construction and use.
0961.3.3 Select appropriate procedures for care and maintenance of textile products/apparel.
0961.3.4 Examine textile legislation, standards, and labeling in the global economy.
0961.3.5 Demonstrate textile design skill.
0961.3.6 Evaluate career paths within the textile industry.

Standard 4: Apparel (0961.S.4)
The student will examine the area of apparel and apply related principles to it.

Apparel Objectives
Students will:
0961.4.1 Evaluate factors that influence clothing design and choices.
0961.4.2 Judge the role of value, quality, and fit in wardrobe selection.
0961.4.3 Evaluate shopping options.
0961.4.4 Demonstrate ability to use technology for fashion design.
0961.4.5 Demonstrate construction techniques used to produce and repair apparel.

0961.4.6 Determine opportunities and preparation requirements for different levels of employment within the apparel industry.

Performance Descriptors (0961.PD.1-4):

- **Distinguished**
  The student has demonstrated mastery of the Standards and Objectives of this course with minimal supervision.

- **Mastery**
  The student has demonstrated mastery of the Standards and Objectives of this course with occasional supervision.

- **Partial Mastery**
  The student has demonstrated mastery of the Standards and Objectives of this course with frequent supervision.

Dental Assisting I

This area of study is comprised of components designed to prepare an individual to function as an integral member of the dental health team and to perform the basic duties of a chairside assistant. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Careers in Dental Assisting (0701.S.1)
Students will research various opportunities for a career in Dental Assisting.

Careers in Dental Assisting Objectives
Students will:
0701,1.1 Describe the primary roles and responsibilities of a dental assistant.
0701,1.2 Explain the relevant safety practices and procedures for dental assisting.
0701,1.3 Discuss the various dental specialty areas that employ dental assistants.
0701,1.4 Discuss educational and career benefits available for dental assistants.
0701,1.5 Identify the importance of ethical practices in the dental office environment.
0701,1.6 Associate health and grooming habits with successful employment as a dental assistant.

Standard 2: Communication (0701.S.2)
Students will demonstrate professional communication skills.

Communication Objectives
Students will:
0701.2.1 Demonstrate the ability to recognize nonverbal communication signals.
0701.2.2 Describe techniques of skillful listening and discuss their importance in communication.
0701.2.3 Explain how courtesy, tact, poise, discretion, and integrity are utilized in communication.
0701.2.4 Utilize effective communication techniques to demonstrate oral hygiene to patients.
0701.2.5 Identify methods of dealing with fears and anxieties of patients.
0701.2.6 Demonstrate correct telephone manner and technique.

Standard 3: Head and Neck Anatomy (0701.S.3)
Students will describe head and neck anatomy.

Effective Head and Neck Anatomy Objectives
Students will:
0701.3.1 Name and describe the purpose of the landmarks of both mandible and maxilla.
0701.3.2 Locate each landmark on an unlabeled drawing.
0701.3.3 Identify the origin, insertion, and action of each muscle of mastication.
0701.3.4 Locate each muscle of mastication on an unlabeled drawing.
0701.3.5 Label paranasal sinuses on a diagram.
0701.3.6 Locate and examine the three major salivary glands and their associated ducts.
0701.3.7 Describe the functions and location of nerves of the head and neck as associated with anesthesia.
0701.3.8 Discuss the properties of local anesthesia and differentiate between block and infiltration injection.
0701.3.9 Demonstrate and explain charting and treatment of an allergic reaction to anesthesia.
0701.3.10 Prepare an anesthetic aspirating syringe for the administration of local anesthesia.
0701.3.11 Disassemble an anesthetic aspirating syringe for sterilization.

Standard 4: Oral Anatomy (0701.S.4)
Students will identify structures and landmarks of the oral cavity and interpret various charting techniques.

Oral Anatomy Objectives
Students will:

0701.4.1	Name the landmarks of the oral cavity and describe their function.
0701.4.2	Label a drawing of all the landmarks of the oral cavity.
0701.4.3	Describe and identify the parts, tissues and functions of each tooth.
0701.4.4	Identify and describe the functions of the supporting structures of the tooth.
0701.4.5	Name the primary and permanent teeth and list the approximate age of eruption.
0701.4.6	Describe the surfaces of each tooth and the abbreviation used for each surface.
0701.4.7	Label deciduous and permanent teeth using the universal numbering system.
0701.4.8	Demonstrate an awareness of different charting techniques including classifications of caries.

Standard 5: Disease Transmission and Prevention (0701.S.5)
Students will describe and practice principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:

0701.5.1	Define, pronounce and spell terminology as related to microbiology, bacteriology, and sterilization.
0701.5.2	Examine the conditions necessary for microorganisms to grow.
0701.5.3	Recognize the cycle of microorganism transmission and prevention.
0701.5.4	Demonstrate knowledge and application of "Standard Precautions".
0701.5.5	Demonstrate proper handwashing technique.

Standard 6: Emergency Medical Care (0701.S.6)
Students will identify the need for and perform basic emergency medical care.

Emergency Medical Care Objectives
Students will:

0701.6.1	Distinguish the four priorities of first aid.
0701.6.2	Explain first aid measures, including symptoms for sudden illness and injury.
0701.6.3	Demonstrate the four methods for the control of bleeding in proper order.
0701.6.4	State the role of the assistant in the administration of oxygen.
0701.6.5	Secure certification for adult, child and infant CPR and choking from American Red Cross or American Heart Association.
0701.6.6	Recognize general characteristics of temperature, pulse, respiration and blood pressure.
0701.6.7	Identify the instruments used to measure vital signs.
0701.6.8	Measure, record and interpret vital signs.

Standard 7: Preventative Dentistry (0701.S.7)
Students will recognize causes, symptoms and treatment for various conditions of the oral cavity related to oral hygiene.

Preventative Dentistry Objectives
Students will:

0701.7.1	State various conditions in the mouth that indicate poor oral hygiene.
0701.7.2	Demonstrate an understanding of proper oral hygiene techniques.
0701.7.3	List and describe the properties of each type of fluoride agent and explain its use.
0701.7.4	Describe the process of applying a topical fluoride agent.
0701.7.5	State the purpose of using a pit and fissure sealant and describe the application process.

Standard 8: Fundamentals of Chairside Assisting (0701.S.8)
Students will associate appropriate materials and instruments with various operative procedures.

Fundamentals of Chairside Assisting Objectives
Students will:

0701.8.1	Identify types, characteristics and uses of hand cutting instruments.
0701.8.2	Identify classifications of handpieces, component parts and their uses.
0701.8.3	Identify types, characteristics and purposes of dental burs.
0701.8.4	List instruments and supplies for various operative procedures.
0701.8.5	Describe types of bases and liners and their principal and secondary use.
0701.8.6	Prepare, measure and mix various bases and liners.
0701.8.7	Describe amalgam composition and explain the safety principles of mercury.
0701.8.8	Show proper technique for mixing and handling amalgam.
0701.8.9	Describe the composite composition and explain the safe use of a high intensity light.
0701.8.10	Tell the steps for various operative procedures.
0701.8.11	Position patient, dentist and assistant for four-handed operative dentistry.
0701.8.12	Interpret various instrument grasps to exchange and retrieve instruments.
0701.8.13	Demonstrate proper use of evacuator, water and air during dental procedures.

Standard 9: Technology (0701.S.9)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:

0701.9.1	Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0701.9.2	Utilize the internet as a resource/research tool.

Standard 10: Student Organization
Students will participate in a Career and Technical Organization (CTSO).

Critical Student Organization Objectives (0701.S.10)
Students will:

0701.10.1	Participate in Health Occupations Students of American (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0701.10.2	Apply parliamentary procedure in organizational meetings.
0701.10.3	Demonstrate team membership skills, such as cooperation and leadership.
0701.10.4	Take part in local, state, and national health care and education projects.

Dental Assisting II

This area of study is comprised of courses designed to prepare an individual to function as a chairside assistant and to perform related office and laboratory procedures under the direction and supervision of the dentist. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Radiation Safety (0702.S.1)
Students will describe radiation safety for the patient and auxiliary personnel.

Radiation Safety Objectives
Students will:

0702.1.1	List the purposes and methods of radiation safety.
0702.1.2	Describe the dangers involved in overexposure to radiation and demonstrate proper safety.
0702.1.3	Identify characteristics of basic types of roentgen rays (x-rays).
0702.1.4	Explain the basic parts and functions of an x-ray unit.

Standard 2: Radiography Technique (0702.S.2)
Students will understand the process of exposing, processing and mounting dental radiographs.

Radiography Objectives
Students will:

0702.2.1	Match facial landmarks associated with roentgenology to the correct definitions.
0702.2.2	Distinguish between intraoral and extraoral radiographic film and describe proper storage of each.
0702.2.3	Explain the film requirements for a full mouth series of radiographs for adults and children.
0702.2.4	Differentiate between periapical and bitewing radiographs.
0702.2.5	Identify oral landmarks associated with periapical radiographs.
0702.2.6	Assemble XCP (X-Tension Cone Paralleling) instrument for periapical and bitewing radiographs.
0702.2.7	Arrange in order the steps to take during radiographic exposure.
0702.2.8	Discuss methods and materials used in developing radiographs.
0702.2.9	Develop, mount and file radiographs.
0702.2.10	Evaluate dental radiographs for diagnostic quality.

Standard 3: Secretarial Procedures (0702.S.3)
Students will perform fundamental secretarial procedures.

Secretarial Procedures Objectives
Students will:

0702.3.1	Describe types of filing systems used in the dental office.
0702.3.2	List the requirements for appointment book entries and schedule appointments.
0702.3.3	Care for incoming mail.
0702.3.4	Explain the importance of a properly completed form.
0702.3.5	Complete registration and health history records.

Standard 4: Accounting Procedures (0702.S.4)
Students will perform fundamental accounting procedures.

Accounting Procedures Objectives
Students will:

0702.4.1	Discuss accounting systems used in a dental office.
0702.4.2	Practice accounting, complete a ledger card, receipts, and balance a daily journal page.
0702.4.3	Explain the purpose of a petty cash fund and describe the handling of petty cash.
0702.4.4	Prepare a bank deposit.
0702.4.5	Discuss methods of maintaining a checking account and write a check.
0702.4.6	State points to remember when handling insurance claims and list basic information found on a claim form.
0702.4.7	Complete a dental insurance form.
0702.4.8	Discuss basic dental computer applications.

Standard 5: Dental Health Team (0702.S.5)
Students will demonstrate the ability to work as an effective member of a dental health team.

Dental Health Team Objectives
Students will:

0702.5.1	Display proper communication techniques while serving as a member of the dental health team.
0702.5.2	Display proper grooming techniques while serving as a member of the dental health team.
0702.5.3	Perform various roles of a dental health team member.
0702.5.4	Given various situations use brainstorming techniques to solve dental health team problems.
0702.5.5	Given various scenarios demonstrate proper ethical decision making skills as related to dental health problems.

Standard 6: Chairside Assisting II (0702.S.6)
Students will assist in four-handed dental procedures and perform other chairside duties.

Chairside Assisting II Objectives
Students will:

0702.6.1	Assist with various four-handed operative procedures.
0702.6.2	Describe the process and assist with the placement of a rubber dam.
0702.6.3	Identify and describe the function of instruments used in each dental specialty.
0702.6.4	Discuss the process of preparing and placing dental matrices.

Standard 7: Dental Materials (0702.S.7)
Students will manipulate dental materials used for various dental procedures.

Dental Materials Objectives
Students will:

0702.7.1	Describe types of cements and their principal and secondary use.
0702.7.2	Prepare, measure and mix various dental cements for luting.
0702.7.3	Discuss the physical and chemical properties of alginate impression material.
0702.7.4	Prepare, mix and place maxillary and mandibular alginate impressions.
0702.7.5	Discuss properties of gypsum materials and their uses.
0702.7.6	Mix and pour gypsum materials into prepared alginate impressions.
0702.7.7	Trim maxillary and mandibular models according to specifications.

Standard 8: Technology (0702.S.8)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:

0702.8.1 Integrate the use of software, hardware, and the Internet to practice and master standards identified in the course.

0702.8.2 Utilize the Internet as a resource/research tool.

Standard 9: Student Organization (0702.S.9)
Students will participate in a Career and Technical Organization (CTSO).

Critical Student Organization Objectives
Students will:

0702.9.1 Participate in Health Occupations Students of American (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (SkillsUSA/VICA).

0702.9.2 Apply parliamentary procedure in organizational meetings.

0702.9.3 Demonstrate team membership skills, such as cooperation and leadership.

0702.9.4 Take part in local, state, and national health care and education projects.

Health Care Fundamentals

The Health Occupations Education student will be introduced to information about health care systems and careers. Information is included on recognition of disease transmission and prevention and the prevention of disease utilizing good nutrition. Students will analyze stages of growth and development and examine human needs. Emphasis will be placed on analyzing and interpreting medical terminology with a focus on medical elements. Students are provided the opportunity to acquire First Aid and CPR certification and are encouraged to affiliate with a Career and Technical Student Organization (CTSO).

Standard 1: Health Care Systems (0711.S.1)

Students will demonstrate knowledge of the general purposes and organization of the various types of health care systems.

Health Care Systems Objectives
Students will:
0711.1.1 Examine systems theory and construct a general systems model listing inputs, throughputs, and feedback loop.
0711.1.2 Compare and contrast health care systems delivering acute and long term care.
0711.1.3 Differentiate major government and voluntary agencies involved in the delivery of health care.
0711.1.4 Identify professional/student organizations as related to specific health care careers.
0711.1.5 Define common terms and abbreviations associated with payment classifications and health insurance plans.
0711.1.6 Distinguish lines of authority or chain of command in a typical health care facility or agency.

Standard 2: Careers (0711.S.2)
Students will research careers in health care systems.

Career Objectives
Students will:
0711.2.1 Research and analyze the duties, educational requirements and employment opportunities of at least ten different health careers.
0711.2.2 Contrast the differences between certification, registration and licensure.
0711.2.3 Research at least one health career by observing or interviewing an individual employed in that field or by requesting information from resources.
0711.2.4 Recognize and interpret at least ten abbreviations used to identify health occupation workers.
0711.2.5 Define, pronounce and spell key terms related to careers in health care.

Standard 3: Disease Transmission and Prevention
Students will demonstrate knowledge of principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:
0711.3.1 Examine the conditions necessary for microorganisms to grow.
0711.3.2 Recognize the cycle of microorganism transmission and prevention.
0711.3.3 Perform proper hand washing technique.
0711.3.4 Demonstrate knowledge of standard precautions.

Standard 4: Human Growth and Development (0711.S.4)
Students will demonstrate a knowledge of human needs/human growth and development.

Human Growth and Development Objectives
Students will:
0711.4.1 Examine and describe the basic stages of human growth and development.
0711.4.2 Identify ways in which life stages affect an individual's needs.
0711.4.3 Describe the individual's need for exercise and activity.
0711.4.4 Evaluate Maslow's Hierarchy of Needs.

0711.4.5 Analyze the five stages of grieving.

Standard 5: Nutrition (0711.S.5)
Students will demonstrate knowledge of nutrition.

Nutrition Objectives
Students will:
0711.5.1 Identify the five basic food groups and the number of daily recommended servings of each.
0711.5.2 Compare and analyze therapeutic diets.
0711.5.3 Name the six groups of essential nutrients and their functions and sources.

Standard 6: Medical Terminology (0711.S.6)
Students will demonstrate knowledge of basic medical terminology.

Medical Terminology Objectives
Students will:
0711.6.1 Define commonly used medical roots, prefixes and suffixes.
0711.6.2 Pronounce and spell commonly used medical roots, prefixes and suffixes.
0711.6.3 Match common medical roots, prefixes, and suffixes with their definitions.

Standard 7: Emergency Medical Care (0711.S.7)
Students will demonstrate knowledge and skill in performing basic emergency medical care.

Emergency Medical Care Objectives
Students will:
0711.7.1 Distinguish the four priorities of First Aid.
0711.7.2 Identify signs, symptoms, and treatment for shock.
0711.7.3 Demonstrate the four methods for the control of bleeding in the order they are used.
0711.7.4 Describe first aid treatment for wounds and the terms associated with each type.
0711.7.5 Describe first aid measures for sudden illness and injury including fainting, stroke, seizures, insulin shock and diabetic coma.
0711.7.6 Demonstrate first aid measures for bone and joint injuries including fracture, dislocation, sprain and strain.
0711.7.7 Demonstrate dressing, bandaging and splinting techniques.
0711.7.8 Recognize first aid measures used for specific injuries involving the eyes, head, nose, ears, chest, abdomen and genital organs.
0711.7.9 Describe first aid measures for temperature related injuries including hot and cold exposure and burns.
0711.7.10 Describe first aid measures for poisoning, stings, bites, and allergic reactions.
0711.7.11 Secure certification in First Aid from American Red Cross or American Heart Association.

Standard 8: CPR and First Aid for Obstructed Airway (0711.S.8)
Students will identify the need for and perform Cardiopulmonary Resuscitation and first aid for an Obstructed Airway.

CPR and First Aid for Obstructed Airway Objectives
Students will:
0711.8.1 Express the risk factors for cardiovascular disease.
0711.8.2 Perform correct CPR technique for the following: infant, child, and one-rescuer adult.
0711.8.3 Identify signs and symptoms of an obstructed airway.
0711.8.4 Identify the signs and symptoms of a heart attack.
0711.8.5 Demonstrate universal distress signal for obstructed airway.
0711.8.6 Perform procedures to relieve airway obstruction in an infant, child and adult.
0711.8.7 Demonstrate the correct use of the AED.
0711.8.8 Secure certification for adult, child and infant CPR and choking from American Red Cross or American Heart Association.

Standard 9: Technology (0711.S.9)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0711.9.1 Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0711.9.2 Utilize the internet as a resource/research tool.

Standard 10: Student Organizations (0711.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0711.10.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (Skills USA/VICA).
0711.10.2 Apply parliamentary procedure in organizational meetings.
0711.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0711.10.4 Take part in local, state, and national health care and education projects.

Supplement to Health Care Fundamentals*

The student will build on standards and objectives introduced in the Health Care Fundamentals course. Within this course students will examine such areas as goal development, critical thinking skills, effective communication, and interpersonal relationships. Utilizing computer simulations of clinical scenarios, students will enhance skills in the analytical and evaluation processes. Upon completion of course standards students will be asked to re-access their personal attitudes and goals in light of new knowledge gained. Students are encouraged to participate in a Career and Technical Student Organization (CTSO). *For health occupation education students who have enrolled at technical centers having already completed Health Care Fundaments (0711).

Standard 1: Goal Development (0713.S.1)

Students will explore self-assessment concepts in order to develop personal and professional goals.

Goal Development Objectives
Students will:

0713.1.1	Explore concepts of self-esteem, values and attitudes.
0713.1.2	Assess personal habits and attitudes.
0713.1.3	Identify professional characteristics necessary for employment in the health care industry.
0713.1.4	Examine the goal setting process.
0713.1.5	Formulate an action plan to achieve personal and academic goals.
0713.1.6	Summarize the importance of time management.

Standard 2: Analytical Skills (0713.S.2)
Students will analyze and evaluate information utilizing clinical simulations.

Analytical Skills Objectives
Students will:

0713.2.1	Analyze clinical scenarios in a critical, objective manner.
0713.2.2	Examine workplace related issues utilizing clinical scenarios.
0713.2.3	Integrate scenario outcomes as they relate to the workplace environment.

Standard 3: Critical Thinking (0713.S.3)
Students will demonstrate effective use of critical thinking skills in the personal decision making process.

Critical Thinking Objectives
Students will:

0713.3.1	Define cognitive processing.
0713.3.2	Examine the different types of thinking.
0713.3.3	Compare and contrast inductive and deductive reasoning.
0713.3.4	Integrate critical thinking skills into personal decision-making.

Standard 4: Effective Communication (0713.S.4)
Students will demonstrate appropriate communication skills in various health care settings.

Effective Communication Objectives
Students will:

0713.4.1	Define methods to improve verbal and nonverbal communication.
0713.4.2	Explore health care consumer-related communication.
0713.4.3	Identify the physical and mental characteristics of listening.
0713.4.4	Create written documentation based on interpretation of clinical scenarios.

Standard 5: Interpersonal Relationships (0713.S.5)
Students will examine elements affecting patient interaction, interpersonal relationships and group dynamics.

Interpersonal Relationships Objectives
Students will:

0713.5.1	Explore the principles of teamwork.
0713.5.2	Summarize factors that affect group dynamics.
0713.5.3	Demonstrate group leadership techniques.
0713.5.4	Identify the steps involved in patient interaction.
0713.5.5	Discuss the relationship between communication and territorial space.

Standard 6: Personal Achievement Assessment (0713.S.6)
Students will re-examine personal attitudes and goals based on newly acquired information.

Personal Achievement Evaluation Objectives
Students will:

0713.6.1	Relate acquired knowledge to potential career success.
0713.6.2	Modify personal goals to reflect mastery of standards.

Standard 7: Technology (0713.S.7)
Students will assess and use electronically produced information to master course standards.

Technology Objectives
Students will:

0713.7.1	Integrate the use of software, hardware and the internet to practice and master standards identified in the course.
0713.7.2	Utilize the internet as a resource and research tool.

Standard 8: Student Organizations (0713.S.8)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:

0713.8.1	Participate in Health Occupations Students of America (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (SkillsUSA/VICA).
0713.8.2	Apply parliamentary procedure in organizational meetings.
0713.8.3	Demonstrate team membership skills, such as cooperation and leadership.
0713.8.4	Take part in local, state, and national health care and education projects.

Concepts Of Health Care

The Health Care Student will be introduced to the personal qualities and communication skills needed to work successfully in a health care setting. The course also integrates advanced medical terminology, building upon basic terminology from the fundamentals course. Major areas of study are the legal and ethical responsibilities of health care workers, patients' rights and legal directives, measurement and assessment, and fundamental math principles used in health care services. Students are encouraged to participate in a Career and Technical Student Organization (CTSO) as part of the course.

Standard 1: Personal Qualities (0715.S.1)
Students will demonstrate awareness of personal qualities as they relate to success as a health care worker.

Personal Qualities Objectives
Students will:
0715.1.1 Describe at least eight personal traits or attitudes desirable in the health care worker.
0715.1.2 Examine basic professional standards of the health care worker as they apply to hygiene, dress, language, confidentiality and behavior.
0715.1.3 Compare the relationship among values, attitudes and behavior.
0715.1.4 Define, pronounce and spell key terms related to personal qualities of the health care worker.

Standard 2: Health Care Consumer (0715.S.2)
Students will demonstrate knowledge of variables that impact the individual health care consumer.

Health Care Consumer Objectives
Students will:
0715.2.1 Compare and contrast health and illness.
0715.2.2 Summarize factors which influence consumer attitudes and use of available health care services.

Standard 3: Communicating Observations (0715.S.3)
Students will apply proper procedures for communicating observations.

Communicating Observation Objectives
Students will:
0715.3.1 Differentiate between subjective and objective reporting.
0715.3.2 Discuss the role of the health care worker in gathering information and in making observations.
0715.3.3 Identify the reasons why observations must be reported promptly, accurately, and objectively.

Standard 4: Communication Skills (0715.S.4)
Students will demonstrate knowledge of effective communication skills in listening, speaking and writing.

Communication skills objectives
Students will:
0715.4.1 Convey and follow multi-step verbal directions.
0715.4.2 Participate in and lead group discussions.
0715.4.3 Organize ideas in an understandable format to plan written or oral communications.
0715.4.4 Compose sentences using correct punctuation and grammar.
0715.4.5 Describe ways one can maintain a courteous and professional approach toward patients/residents, families, the health care team, and the public.
0715.4.6 Differentiate basic principles of therapeutic communication.
0715.4.7 Utilize the three essential elements of effective communication.

0715.4.8 Apply appropriate telephone etiquette in answering the telephone and in recording messages.
0715.4.9 Assess alternate methods of communication with the hearing, vision, or speech impaired.

Standard 5: Medical Terminology (0715.S.5)
Students will demonstrate knowledge of advanced medical terminology.

Medical Terminology Objectives
Students will:
0715.5.1 Interpret common medical terms.
0715.5.2 Incorporate standard medical abbreviations and terms in written communications.
0715.5.3 Pronounce and spell medical terms.
0715.5.4 Analyze and compare common medical terms with their definitions.

Standard 6: Legal Issues and Ethics (0715.S.6)
Students will demonstrate knowledge of legal responsibilities and ethics in the health care setting.

Legal Issues and Ethics Objectives
Students will:
0715.6.1 Define, pronounce and spell common terms related to legal responsibilities and ethics in health care.
0715.6.2 Analyze privileged communications and explain how they apply to health care.
0715.6.3 Summarize and apply resident's/patient's bill of rights.
0715.6.4 Detect violations of resident's/patient's bill of rights.
0715.6.5 Differentiate between laws and ethics as related to health care.
0715.6.6 Examine basic professional standards as a safeguard for the health care worker, the employer and the client/resident/patient.
0715.6.7 Explain the concept of operating within one's scope of practice.

Standard 7: Math (0715.S.7)
Students will manipulate mathematical skills as they relate to health care professions.

Math Objectives
Students will:
0715.7.1 Perform the computations addition, subtraction, multiplication and division.
0715.7.2 Measure and compute using integers, fractions, and decimals and convert between metric/household systems.
0715.7.3 Solve problems involving ratio and proportions.
0715.7.4 Select and analyze appropriate diagrams, charts, graphs and tables to plot information.

Standard 8: Measurement and Assessment (0715.S.8)
Students will demonstrate knowledge and skill in measurement and assessment.

Measurement and Assessment Objectives
Students will:
0715.8.1 Describe the four main vital signs.
0715.8.2 Assess and compare the normal ranges for vital signs.
0715.8.3 Utilize appropriate supplies and equipment for measuring vital signs.
0715.8.4 Measure and record vital signs.
0715.8.5 Recognize and report abnormal vital signs.
0715.8.6 Relate vital signs to disease processes.
0715.8.7 Measure and record results of procedures such as height and weight, vital signs, intake and output, and circumference using appropriate mathematical calculations.
0715.8.8 Analyze and interpret diagrams, charts, graphs and tables.

Standard 9: Technology (0715.S.9)
Students will access and use electronically produced information to master course standards.

Technology Objectives
Students will:
0715.9.1 Use software and hardware to practice and master standards identified in the course.
0715.9.2 Use the Internet as a resource/research tool.

Standard 10: Student Organizations (0715.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0715.10.1 Participate in Health Occupations Students of America (HOSA) or Skills USA/ Vocational Industrial Clubs of America (Skills USA/VICA).
0715.10.2 Apply parliamentary procedure in organizational meetings.
0715.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0715.10.4 Take part in local, state and national health care and education projects.

Clinical Concepts*

Students will be introduced to safe work practices for the prevention of illness or injury to clients, co-workers, and self. The course includes a study of the basic structures and major functions of the human body and common disorders associated with each body system. Also included is instruction on disease transmission/prevention, standard precautions, OSHA standards, and principles of sterile technique. In this course, students begin study in a specialized occupational area and build a foundation for more complex and correlated clinical practice within Diversified Clinical Applications (0719). Students are encouraged to participate in a Career and Technical Students Organization (CTSO). *For students desiring preparation for an entry level occupation in health care and who plan to enroll in Diversified Clinical Applications (0719).

Standard 1: Fire Safety (0717.S.1)
Students will demonstrate knowledge of fire safety in the clinical areas.

Fire Safety Objectives
Students will:
0717.1.1 Identify components necessary for the ignition of a fire.
0717.1.2 Demonstrate the proper use of the fire extinguisher.
0717.1.3 Analyze methods to prevent fire and electrical hazards.
0717.1.4 Follow emergency procedures and protocols.

Standard 2: Environmental Safety (0717.S.2)
Students will demonstrate knowledge of environmental safety hazards in the clinical setting.

Safety Objectives
Students will:
0717.2.1 Identify common safety hazards in health care facilities.
0717.2.2 Describe common equipment associated with accidents and methods of prevention.
0717.2.3 Identify routine precautions to be used in oxygen therapy.
0717.2.4 Interpret guidelines in the use of patient/resident safety devices.

Standard 3: Body Mechanics (0717.S.3)
Students will demonstrate knowledge and skill in the use of body mechanics.

Body Mechanics Objectives
Students will:
0717.3.1 Define terms related to body mechanics.
0717.3.2 Apply principles of body mechanics, such as proper lifting techniques.
0717.3.3 Choose appropriate mechanical lifting devices in given situations.
0717.3.4 Transport patient/resident by wheelchair and stretcher.
0717.3.5 Identify safety precautions to be used when positioning and transferring patient/resident.

Standard 4: Body Structure and Function (0717.S.4)
Students will demonstrate knowledge of basic structure and function for each system of the human body in health and common disorders for each.

Body Structure and Function Objectives
Students will:
0717.4.1 Identify structures and functions of major body systems.
0717.4.2 Explain the integration between body systems.
0717.4.3 Define, pronounce, and spell commonly used terms and abbreviations.
0717.4.4 Compare the relationship of wellness to healthy structures and functions of body systems.
0717.4.5 Identify health risk factors and how these influence disease process.
0717.4.6 Describe common disorders in body systems and their diagnosis and treatment.

Standard 5: Disease Transmission and Prevention (0717.S.5)
Students will demonstrate knowledge of principles of disease transmission and prevention.

Disease Transmission and Prevention Objectives
Students will:
0717.5.1 Match terms related to infection control with their definitions.
0717.5.2 Describe the function of the immune system, including the appropriate tissues and organs.
0717.5.3 Recognize clinical situations that involve potential growth of microorganisms.
0717.5.4 Identify common nosocomial infections.
0717.5.5 Identify common pathogenic microorganisms.
0717.5.6 Apply the knowledge of the chain of infection to clinical practice.
0717.5.7 Apply proper hand washing technique to clinical situations.
0717.5.8 Compare the effectiveness of methods used to destroy bacteria.
0717.5.9 Select appropriate personal protective equipment and clothing for specific tasks.
0717.5.10 Don and remove Personal Protective Equipment (PPE).
0717.5.11 Summarize and differentiate the isolation categories established by the Centers for Disease Control (CDC).
0717.5.12 Describe methods of handling biohazard equipment, supplies, specimens and waste.
0717.5.13 Apply OSHA standards as established for clinical situations.
0717.5.14 Describe the components of an exposure incident.
0717.5.15 Complete an incident report.
0717.5.16 Recognize symbols for biohazards and standard precautions.

Standard 6: Sterile Technique (0717.S.6)

Students will apply principles of sterile technique.

Sterile Techniques Objectives
Students will:
0717.6.1 Compare and contrast methods of sterilization.
0717.6.2 Practice and maintain a clean and healthy environment.
0717.6.3 Compare and contrast medical asepsis and surgical asepsis.
0717.6.4 Demonstrate prescribed techniques as related to sterility.
0717.6.5 Assess and initiate proper storage methods and monitor expiration periods for sterilized equipment.
0717.6.6 Assist with sterile procedures, including but not limited to setting up a sterile field, donning sterile gloves, and transfer techniques.

Standard 7: Specialty Area Procedure (0717.S.7)
Students will implement procedures within the scope of specialty area.

Specialty Area Procedures Objectives
Students will:
0717.7.1 Utilize appropriate supplies and equipment.
0717.7.2 Maintain and calibrate equipment.
0717.7.3 Explain specialty/specific procedures and provide related information.
0717.7.4 Perform procedures according to industry standards and manufacturers directions.
0717.7.5 Perform procedures in a logical and sequential manner.
0717.7.6 Customize, adjust or modify procedures as needed and within established guidelines.
0717.7.7 Document procedures accurately.
0717.7.8 Recognize and report abnormal findings.

Standard 8: Technology (0717.S.8)
Students will access and use electronically produced information to master course standards.

Technology Objectives
Students will:
0717.8.1 Describe computer applications currently being used in today's health care setting.
0717.8.2 Use software and hardware to practice and master concepts identified in the course.
0717.8.3 Use the internet as a resource/research tool.

Standard 9: CPR (0717.S.9)
Students will demonstrate knowledge and skill in performing health care provider/professional level Cardiopulmonary Resuscitation.

CPR Objectives
Students will:
0717.9.1 Analyze the differences in the performance of CPR as it pertains to the health professional.
0717.9.2 Secure certification in CPR for the Professional Rescuer from American Red Cross or Health Care Provider (HCP) from American Heart Association.

Standard 10: Student Organizations (0717.S.10)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0717.10.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0717.10.2 Apply parliamentary procedure in organizational meetings.
0717.10.3 Demonstrate team membership skills, such as cooperation and leadership.
0717.10.4 Take part in local, state, and national health care and education projects.

Diversified Clinical Applications*

Students will be provided with entry-level knowledge and skills needed to function in a variety of health care settings. Students are required to choose a specialized occupational area for in-depth classroom study and must complete a minimum of 55-100 hours in a correlated (work-based) clinical experience as part of the course. Specialized courses with more in-depth instructional standards and objectives have been established for specific occupations. These appear in the *Program Guide for Health Occupations Education in West Virginia*. All standards and objectives must be mastered before students attain established credentials and/or industry validation. Students are encouraged to participate in a Career and Technical Student Organization (CTSO). *For students who are preparing for entry level employment in a health occupation.

Standard 1: Employment (0719.S.1)
Students will be prepared for entry-level employment in a health occupation.

Employment Objectives
Students will:
0719.1.1 Achieve course objectives for classroom study in a specialized occupational area.
0719.1.2 Achieve objectives for clinical internships established for occupational specializations, i.e., dental assisting.
0719.1.3 Meet entry-level requirements for certification or registration in a health occupation.

Standard 2: Technology (0719.S.2)
Students will access and use electronically produced information and computers within the health care system.

Technology Objectives
Students will:
0719.2.1 Utilize a computer to input, store and retrieve information.
0719.2.2 Utilize software, hardware, and the Internet to practice and master course standards.

Standard 3: Clinical Internship (0719.S.3)
Students will participate in a clinical internship.

Clinical Internship Objectives
Students will:
0719.3.1 Demonstrate a working knowledge of externship eligibility requirements.
0719.3.2 Comply with required health regulations such as proof of physical examination and immunization status.
0719.3.3 Provide proof of personal health insurance.
0719.3.4 Wear proper clinical attire.
0719.3.5 Maintain academic standards in classroom theory and lab.
0719.3.6 Report to clinical site on time and ready to work.
0719.3.7 Notify clinical site and instructor when absent.
0719.3.8 Conform to policies regarding performance of skills and scope of responsibility.
0719.3.9 Correctly and safely perform entry-level procedures under supervision of an instructor or clinical site preceptor.
0719.3.10 Request assistance or clarification as needed.
0719.3.11 Maintain professional standards including client confidentiality.
0719.3.12 Organize and effectively manage time.
0719.3.13 Complete documentation required of clinical internship accurately.
0719.3.14 Participate in clinical internship evaluation process.
0719.3.15 Utilize facility resources, i.e., other staff members, manuals, and training updates.

Standard 4: Job Seeking and Keeping (0719.S.4)
Students will identify strategies for job seeking and job keeping.

Job Seeking and Keeping Objectives
Students will:
0719.4.1 Identify the steps involved in job analysis and research.
0719.4.2 Analyze various career options and the preparation required for them.
0719.4.3 Complete a job application, cover letter and resume.
0719.4.4 Demonstrate skills related to the interviewing process.
0719.4.5 Exhibit personal skills such as attendance, time management, and individual responsibility.
0719.4.6 Maintain professional conduct and appearance.
0719.4.7 Utilize analytical skills to solve problems and make decisions.
0719.4.8 Recognize attitudes and behaviors necessary for establishing successful working relationships.
0719.4.9 Judge alternatives for dealing with harassment, bias, and discrimination based on race, color, national origin, sex, religion, gender, handicap, or age.
0719.4.10 Recognize and adhere to the chain of command/lines of authority in the work setting.
0719.4.11 Exhibit characteristics necessary for advancement.
0719.4.12 Recognize the importance of participating in continuing education programs.
0719.4.13 Manage conflict within the workplace through consideration of other's points of view.
0719.4.14 Prepare a letter of resignation.
0719.4.15 Practice team membership skills such as leadership and cooperation.
0719.4.16 Identify the importance of and develop good customer relation skills.

Standard 5: Student Organizations (0719.S.5)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organization Objectives
Students will:
0719.5.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (SkillsUSA/VICA).
0719.5.2 Apply parliamentary procedure in organizational meetings.
0719.5.3 Demonstrate team membership skills, such as cooperation and leadership.
0719.5.4 Take part in local, state, and national health care and education projects.

Medical Terminology

Through the study of medical terminology the student will be introduced to the language of medicine. Students will gain an understanding of basic elements, rules of building and analyzing medical words, and medical terms associated with the body as a whole. Utilizing a systems approach, the student will define, interpret, and pronounce medical terms relating to structure and function, pathology, diagnosis, clinical procedures, oncology, and pharmacology. In addition to medical terms, common abbreviations applicable to each system will be interpreted.

Standard 1: Basic Elements of Medical Words (0721.S.1)
Students will effectively use basic medical elements.

Basic Elements of Medical Words Objectives
Students will:

0721.1.1 Identify the four elements that are used to form medical words.
0721.1.2 Analyze medical words by identifying their component elements.
0721.1.3 Describe the basic rules for building medical words.
0721.1.4 Explain the basic steps to defining medical words.
0721.1.5 Analyze the position and role of the suffix when used in a medical term.
0721.1.6 Identify and pronounce surgical, diagnostic, and symptomatic suffixes.
0721.1.7 Analyze suffixes to determine their part of speech.
0721.1.8 Define a diminutive suffix.
0721.1.9 Analyze the position and role of the prefix when used in building medical terms.
0721.1.10 Identify and pronounce prefixes including those indicating position, number, measurement, negation, and direction.

Standard 2: Medical Terminology Associated With the Body As A Whole (0721.S.2)
Students will demonstrate use of medical terminology associated with the body as a whole.

Medical Terminology Associated With the Body As A Whole Objectives
Students will:

0721.2.1 Identify the medical terms associated with the levels of organization of structure and function within the human body.
0721.2.2 Demonstrate an understanding of the disease process by defining medical terms used in pathology.
0721.2.3 Define and pronounce the medical terms used in the anatomical planes of the body, body cavities, and diagnostic imaging.
0721.2.4 Analyze medical terms indicating directional position.
0721.2.5 Interpret the meaning of abbreviations used to indicate body systems, direction, and diagnostic imaging.

Standard 3: Medical Terminology Associated with Body Systems (0721.S.3)
Students will effectively use medical terminology associated with body systems.

- Integumentary
- Gastrointestinal
- Respiratory
- Cardiovascular
- Blood and Lymphatic
- Musculoskeletal
- Genitourinary
- Reproductive
- Endocrine
- Nervous
- Special Senses

Medical Terminology Associated with Body Systems Objectives
The student will:

0721.3.1 Define and pronounce medical terms used to identify the basic structure and function.
0721.3.2 Interpret the meaning of combining forms, suffixes, and prefixes.

0721.3.3	Define and discuss medical terms associated with basic pathology.
0721.3.4	Interpret commonly used diagnostic and symptomatic medical terms.
0721.3.5	Identify and define medical terms used as related to surgical, diagnostic imaging, and laboratory procedures.
0721.3.6	Define medical terms associated with clinical procedures used in the process of examination and evaluation of structure and function.
0721.3.7	Analyze medical terms related to oncology.
0721.3.8	Describe medical terms used in pharmacology to treat common disorders.
0721.3.9	Interpret the meaning of common abbreviations.

Medical Assistant I

This course contains the beginning concepts and skills the student will need for entry level employment as a Medical Assistant for both clinical and administrative duties. Major instructional concepts include: orientation to the career of Medical Assistant, ethics and liability, medical terminology, communication, safety, disease transmission and prevention, anatomy and physiology and clinical procedures. The instructional program content is based upon state guidelines and an occupational analysis of the medical assistant field. Adjustments are made to coincide with local physicians offices and clinics as determined by the instructor, administrator and advisory committee. Students are encouraged to participate in a Career and Technical Students Organization (CTSO).

Standard 1: Role, Function and Career Preparation (0731.S.1)
Students will identify concerning the role, function and career preparation for the medical assistant.

Role, Function and Career Preparation Objectives
Students will:
0731.1.1 Analyze the role and responsibilities of a medical assistant.
0731.1.2 Identify, evaluate and apply ideal attributes of a medical assistant.
0731.1.3 Research medical assistant career opportunities.
0731.1.4 Identify student and professional organizations applicable to the medical assistant.
0731.1.5 Demonstrate job seeking and job keeping skills.
0731.1.6 Explain accreditation, certification and continuing education as they pertain to the professional medical assistant.

Standard 2: Ethics And Liability (0731.S.2)
Students will demonstrate knowledge of medical ethics and liability.

Ethics And Liability Objectives
Students will:
0731.2.1 Explain the Code of Ethics for Medical Assistants and the Medical Assistant Creed.
0731.2.2 Describe the Patient's Bill of Rights.
0731.2.3 Define and describe Advanced Directives.
0731.2.4 Define and apply Privileged Communication as it pertains to the medical office.
0731.2.5 Summarize the difference between ethics and law.
0731.2.6 Compare and contrast Implied Consent and Expressed Consent and their application.
0731.2.7 Demonstrate the rules governing Medical Charting.
0731.2.8 Illustrate instances of legal required disclosure.
0731.2.9 Identify Civil and Criminal Law as if pertains to the medical office setting.

Standard 3: Medical Terminology (0731.S.3)
Students will demonstrate knowledge of basic medical terminology.

Medical Terminology Objectives
Students will:
0731.3.1 Interpret commonly used medical roots, prefixes and suffixes.
0731.3.2 Interpret commonly used abbreviations.
0731.3.3 Incorporate standard medical terms and abbreviations in written and oral communications.

Standard 4: Communication (0731.S.4)
Students will learn to communicate effectively with clients and personnel in the medical office.

Communication Objectives
Students will:
0731.4.1 The principles of verbal and non-verbal communication.
0731.4.2 Give and explain proper patient instruction as it relates to basic health care, common medical procedures, and applicable community resources.
0731.4.3 Interpret telephone messages and select appropriate course of action.

Standard 5: Safety (0731.S.5)
Students will describe contributions of the medial assistant to the medical office environment as it pertains to safety issues.

Safety Objectives
Students will:
0731.5.1 Discuss and summarize the OSHA and CDC regulations that apply to the medical office.
0731.5.2 Identify potential office hazards and explain corrective measures.
0731.5.3 Assess common medical emergencies and determine the sequence of appropriate actions, including CPR and the Heimlich maneuver.

Standard 6: Disease Transmission And Prevention (0731.S.6)
Students will demonstrate principles of disease transmission and prevention.

Disease Transmission And Prevention Objectives
Students will:
0731.6.1 Analyze the conditions necessary for the growth and transmission of microbial organisms and ways to prevent the spread of infection.
0731.6.2 Apply CDC guidelines and OSHA standards as established for clinical situations.

Standard 7: Body Structure And Function (0731.S.7)
Students will demonstrate knowledge of basic structure and function for each system of the human body.

Body Structure And Function Objectives
Students will:
0731.7.1 Identify and describe the major structures of each body system.
0731.7.2 Identify and analyze the major functions of each body system.
0731.7.3. Explain the integration between body systems.
0731.7.4 Define, pronounce and spell terms and abbreviations commonly used.
0731.7.5 Describe common disorders in body systems and their diagnosis and treatment.

Standard 8: Physical Examination (0731.S.8)
Students will apply knowledge of basic physical examination skills.

Physical Examination Objectives
Students will:
0731.8.1 Perform screening procedures including the measurement and recording of vital signs, height and weight, vision and hearing screening, and chief complaint.
0731.8.2 Perform assisting skills including positioning and draping, eye and ear procedures, and assisting with special examinations.

Standard 9: Medical and Surgical Asepsis (0731.S.9)
Students will demonstrate knowledge of medical and surgical asepsis.

Medical and Surgical Asepsis Objectives
Students will:
0731.9.1 Differentiate between sanitization, disinfection and sterilization practices and their application in the medical office setting.
0731.9.2 Define and apply techniques of surgical aseptic practices including sterile technique, assisting with minor surgery, and wound care.

Standard 10: Laboratory Procedures (0731.S.10)
Students will demonstrate knowledge of basic laboratory procedures.

Laboratory Procedures Objectives
Students will:
0731.10.1 Explain and discuss the laboratory practices that yield quality assurance and quality control.
0731.10.2 Identify and illustrate the purpose of laboratory tests commonly performed in a medical office, distinguishing between normal and abnormal results.
0731.10.3 Understand and practice accepted standards for specimen collection methods.
0731.10.4 Understand and practice accepted standards for specimen processing methods.
0731.10.5 Record and report laboratory procedures.
0731.10.6 Perform a 12-lead electrocardiogram.

Standard 11: Technology (0731.S.11)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0731.11.1 Integrate the use of software, hardware, and the internet to practice and master standards identified in the course.
0731.11.2 Utilize the internet as a resource/research tool.

Standard 12: Student Organizations (0731.S.12)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0731.12.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/ Vocational Industrial Clubs of America (Skills USA/VICA).
0731.12.2 Apply parliamentary procedure in organizational meetings.
0731.12.3 Demonstrate team membership skills, such as cooperation and leadership.
0731.12.4 Take part in local, state, and national health care and education projects.

Medical Assistant II

The student will receive the skills needed for entry-level employment as a Medical Assistant for both clinical and administrative duties. Major instructional concepts include: administrative procedures, insurance, coding and billing, principles of pharmacology and medication administration. Correlated clinical experience is an integral component of this course. Students must complete a clinical internship with a minimum of 100 hours. The instructional program content is based upon state guidelines and an occupational analysis of the medical assistant field. Adjustments are made to coincide with local physicians offices and clinics as determined by the instructor, administrator and advisory committee. Students are encouraged to participate in a Career and Technical Student Organization (CTSO).

Standard 1: Administrative Medical Assistant Duties (0732.S.1)
Students will perform office procedures related to administrative medical assistant duties.

Medical Assistant Duties Objectives
Students will:
0732.1.1 Adapt techniques for patient reception, telephone procedures and appointment scheduling.
0732.1.2 Maintain patient records and files.
0732.1.3 Demonstrate basic banking procedures.
0732.1.4 Demonstrate basic accounting skills.
0732.1.5 Operate basic office equipment.

Standard 2: Insurance, Coding, Billing (0732.S.2)
Students will demonstrate an understanding of medical insurance practices, including coding and billing.

Insurance, Coding, Billing Objectives
Students will:
0732.2.1 Discuss and analyze insurance terms and the purpose of coding.
0732.2.2 Complete a basic insurance form.
0732.2.3 Describe computer databases and their usefulness to the medical office.
0732.2.4 Describe computerized office practices for the medical office.

Standard 3: Pharmacology (0732.S.3)
Students will identify principles of pharmacology.

Pharmacology Objectives
Students will:
0732.3.1 Discuss and summarize the legal role and responsibilities of the medical assistant as it pertains to the administration of medications.
0732.3.2 Describe and examine general principles of pharmacology, classification and schedules of drugs.
0732.3.3 Identify and describe the methods of inventory, storage, dispensation, and disposal of drugs.
0732.3.4 Identify and discuss the written information on a prescription or physician's order including the abbreviations and symbols.

Standard 4: Medication Administration (0732.S.4)
Students will identify principles in the administration of medications

Medication Administration Objectives
Students will:
0732.4.1 Distinguish between the systems of measurements.
0732.4.2 Describe and practice safety measures related to the administration of medications.

0732.4.3 Identify and classify preferred routes of administration and sites of administration.
0732.4.4 Select the proper syringe and needle for the administration of parenteral medications.
0732.4.5 Administer medications by various routes.

Standard 5: Clinical Internship (0732.S.5)
Students will participate in a clinical internship with a minimum of 100 hours.

Clinical Internship Objectives
Students will:
0732.5.1 Demonstrate a working knowledge of internship eligibility requirements.
0732.5.2 Comply with required health regulations such as proof of physical examination and immunization status.
0732.5.3 Provide proof of personal health insurance.
0732.5.4 Wear proper clinical attire.
0732.5.5 Maintain academic standards in classroom theory and lab.
0732.5.6 Report to clinical site on time and ready to work.
0732.5.7 Notify clinical site and instructor when absent.
0732.5.8 Conform to policies regarding performance of skills and scope of responsibility.
0732.5.9 Correctly and safely perform entry-level procedures under the supervision of an instructor or clinical site preceptor.
0732.5.10 Request assistance or clarification as needed.
0732.5.11 Maintain professional standards including client confidentiality.
0732.5.12 Organize and effectively manage time.
0732.5.13 Complete documentation required of clinical internship accurately.
0732.5.14 Participate in the clinical internship evaluation process.
0732.5.15 Utilize facility resources i.e., other staff members, manuals, and training updates.

Standard 6: Technology (0732.S.6)
Students will demonstrate knowledge of computers and their use within the health care system.

Technology Objectives
Students will:
0732.6.1 Integrate the use of software, hardware, and the Internet to practice and master standards identified in the course.
0732.6.2 Utilize the Internet as a resource/research tool.

Standard 7: Student Organizations (0732.S.7)
Students will participate in a Career and Technical Student Organization (CTSO).

Student Organizations Objectives
Students will:
0732.7.1 Participate in Health Occupations Students of America (HOSA) or SkillsUSA/Vocational Industrial Clubs of America (Skills USA/VICA).
0732.7.2 Apply parliamentary procedure in organizational meetings.
0732.7.3 Demonstrate team membership skills, such as cooperation and leadership.
0732.7.4 Take part in local, state, and national health care and education projects.

Lodging Management I

Course Description: The Lodging Management Program (LMP) is a two-year lodging curriculum developed by the Educational Institute of the American Hotel and Lodging Association with input from thousands of lodging professionals across the nation. The courses integrate academic and hands-on activities to provide an overview of the industry and competencies necessary for success in various areas of the lodging industry. Completers of the Lodging Management Program are eligible for a national certificate from the American Hotel and Lodging Association. Students must pass rigorous tests at the end of each course and complete a 400 hour, off-campus, paid internship.

Standard 1: Describe the organization and structure of lodging property management. (1201.S.1)

Lodging Property Management Objectives
Students will:
1201.1.1 Identify types of lodging properties.
1201.1.2 Define and discuss each type of lodging property.
1201.1.3 Group lodging properties based on their purpose, location and guests served.
1201.1.4 Identify the classes of lodging properties.
1201.1.5 Identify the differences in levels of service provided by each class of lodging property.
1201.1.6 Explain lodging property ownership and affiliation differences.
1201.1.7 Create an organization chart for a lodging property.
1201.1.8 Classify functional areas of a lodging property by revenue or support centers.
1201.1.9 Diagram the functional areas of the front-of-the-house and the back-of-the-house at a lodging property.
1201.1.10 Create a chart that lists hotel divisions and departments.
1201.1.11 Explain the functions of each division and department at a lodging property.

Standard 2: Explore the elements and strategies of guest service. (1201.S.2)

Guest Service Objectives
Students will:
1201.2.1 Identify the elements of good guest service.
1201.2.2 Distinguish between marketing tangible products and intangible products to guests.
1201.2.3 Describe the involvement of customers in service.
1201.2.4 Describe the concerns of maintaining quality control in relation to guest services.
1201.2.5 Distinguish between controlling inventory and controlling guest demand.
1201.2.6 Analyze time distribution channels in service.
1201.2.7 Explain the role of strategic planning in guest service.
1201.1.8 Create a flow chart showing the steps needed in a strategic plan for guest services.
1201.1.9 Define moments of truth in guest services.
1201.1.10 Set guest services standards for a lodging property.

Standard 3: Prepare for positions in the hospitality industry. (1201.S.3)

Hospitality Industry Objectives:
Students will:
1201.3.1 Chart entry, skilled and managerial level positions in the lodging industry.
1201.3.2 List the career opportunities available for the lodging and food service industry.
1201.3.3 List and discuss career opportunities available with clubs, airlines, cruise lines and travel agencies.
1201.3.4 Create a career ladder for the lodging industry.
1201.3.5 Complete an application and write a letter of application.
1201.3.6 Write a resume.

1201.3.7 Participate in the interview process through mock interviews.
1201.3.8 Compile a career portfolio.

Standard 4: Identify tasks and demonstrate procedures performed by front office employees. (1201.S.4)

Front Office Employees Objectives
Students will:
1201.4.1 Outline the stages in the guest cycle.
1201.4.2 Categorize the events that occur during the guest's pre-arrival, arrival, occupancy and departure stages.
1201.4.3 Examine the importance of protecting a guest's right to privacy.
1201.4.4 Use a logbook to record front office activities.
1201.4.5 Explain the importance of good communication skills in front office positions.
1201.4.6 Create an information directory.
1201.4.7 Create a split folio and master folio.
1201.4.8 List types of equipment and supplies loaned to guests and identify property policies for those items.
1201.4.9 Demonstrate proper handling of guest mail and packages.
1201.4.10 Identify special needs guests and explain roles and responsibilities of the staff.
1201.4.11 Categorize the types of guest complaints and create a priority list.
1201.4.12 Identify and create policies on how to handle guest complaints.
1201.4.13 Develop a follow-up checklist for guest complaints.
1201.4.14 Evaluate the role of front office employees in security.
1201.4.15 Define and explain types of keys used and key control measures taken to protect guests.
1201.4.16 Outline locking systems and their role in protecting guests.
1201.4.17 Create a plan for front desk surveillance, access control, protecting hotel funds and limiting liability of safe deposit boxes.
1201.4.18 Describe lost and found procedures and timelines.
1201.4.19 Develop emergency response procedures and assign staff responsibilities.

Standard 5: Analyze the role of telecommunications in the front office. (1201.S.5)

Telecommunications Objectives
Students will:
1201.5.1 Explain direct-dial calling, operated assisted calls and premium price calls of the guest.
1201.5.2 Outline the functions of a PBX system.
1201.5.3 Demonstrate how a HOBIC works.
1201.5.4 Define a call accounting system.
1201.5.5 List types of phones and map their locations at a lodging property.
1201.5.6 Take and deliver faxes and messages to the guest.
1201.5.7 Demonstrate wake up call procedures and voice mail instructions.
1201.5.8 Demonstrate email and TDD technology offered to the guest.

Standard 6: Learn the functions required for making a guest reservation. (1201.S.6)

Guest Reservation Objectives
Students will:
1201.6.1 Define various types of reservations.
1201.6.2 List the factors of a binding agreement between the lodging property and a potential guest.
1201.6.3 Describe a global distribution system.
1201.6.4 Define an intersell agency.
1201.6.5 List the ways properties directly receive reservations.
1201.6.6 Make a reservation through the internet.

1201.6.7 Contrast affiliate and non-affiliate reservation networks.
1201.6.8 Outline the functions of a central reservations office.
1201.6.9 Access and perform tasks necessary for operating a reservation computer system.
1201.6.10 Identify information needed for forecasting occupancy rates.
1201.6.11 Calculate percentages of no-shows, walk-ins, overstays and understays.
1201.6.12 Create a three-day and ten-day forecast.

Standard 7: Describe the processes involved in the guest registration cycle. (1201.S.7)

Guest Registration Cycle Objectives
Students will:
1201.7.1 Identify the functions and purposes of pre-registration.
1201.7.2 Demonstrate the use of guest registration cards.
1201.7.3 Describe and chart the flow of registration information throughout the lodging property.
1201.7.4 Determine when a room is available for sale and how to communicate room status reports.
1201.7.5 List and interpret rate schedules and special room rates.
1201.7.6 Demonstrate upselling techniques.
1201.7.7 Describe procedures used when turning guests away and referring guest to another property.
1201.7.8 Outline complete registration procedures.
1201.7.9 Discuss various forms of payment accepted.
1201.7.10 Explain property policies on issuing room keys.
1201.7.11 Instruct guests about promotional or special incentive programs available to them.
1201.7.12 Identify features of the guest accounting module of the computer system.
1201.7.13 Create individual, master, non-guest, employee, control, semi-permanent and permanent folios.
1201.7.14 Discuss various types of entries that can be made to guest accounts.

Standard 8: Learn to perform guest checkout and settlement procedures. (1201.S.8)

Guest Checkout and Settlement Procedures Objectives
Students will:
1201.8.1 Resolve outstanding account balances using various forms of payment.
1201.8.2 Update room status.
1201.8.3 Create a guest history.
1201.8.4 List departure procedures and three methods of check out options.
1201.8.5 List the steps involved in internal control.
1201.8.6 Complete a front office cash sheet and explain the procedures used for cash banks.
1201.8.7 Explain the purpose of a financial records audit.
1201.8.8 Complete a daily operations report.
1201.8.9 Calculate occupancy ratios and opening ratios.
1201.8.10 Interpret room revenue and room division budget reports.

Standard 9: Demonstrate night audit procedures. (1201.S.9)

Night Audit Objectives
Students will:
1201.9.1 Identify and describe the functions of a night auditor.
1201.9.2 Use the basic account posting formula to complete outstanding postings.
1201.9.3 Reconcile room status discrepancies and balance departmental revenue.
1201.9.4 Verify room rates and no-show reservations.
1201.9.5 Post room rates and taxes.
1201.9.6 Prepare a cash deposit.
1201.9.7 Distribute reports after backing up the system.

Standard 10: Explain the functions of the housekeeping department. (1201.S.10)

Housekeeping Objectives
Students will:
1201.10.1 Identify and create a checklist for the cleaning responsibilities of the housekeeping department.
1201.10.2 Create an inventory list of work performance standards and a frequency schedule.
1201.10.3 Identify steps necessary in staffing and scheduling for the housekeeping department.

Standard 11: Explain the role of inventory control in housekeeping department. (1201.S.11)

Inventory Control Objectives
Students will:
1201.11.1 Identify how recycled and non-recycled inventories are maintained.
1201.11.2 Calculate expected inventories and establish inventory levels.
1201.11.3 Identify types of linens and calculate necessary par levels for each type.
1201.11.4 Take a physical inventory of linens and describe effective inventory control methods.
1201.11.5 Describe purchasing responsibilities of the executive housekeeper.
1201.11.6 Identify factors to be considered in an annual linen purchase.

Standard 12: Demonstrate correct guest room cleaning procedures. (1201.S.12)

Cleaning Procedures Objectives
Students will:
1201.12.1 Assemble guest room cleaning supplies on a housekeeping cart.
1201.12.2 Complete a guest room assignment sheet and a room status report.
1201.12.3 Enter a guest room properly.
1201.12.4 Perform basic cleaning tasks in a safe and efficient manor and conduct an inspection.
1201.12.5 Identify new technology that has effected guest room cleaning.

Standard 13: Demonstrate knowledge of on-premise laundry management practices. (1201.S.13)

Laundry Management Practices Objectives
Students will:
1201.13.1 Explain the characteristics of various fabric types.
1201.13.2 List the steps in the laundry cycle.
1201.13.3 Oversee the collection and transportation of soiled linens.
1201.13.4 Demonstrate the proper procedures for sorting, loading, extracting and washing of different linen types.
1201.13.5 Demonstrate the proper procedures for drying, ironing, folding and storing linens.
1201.13.6 Identify types of commercial laundry equipment.
1201.13.7 Outline the importance of a safe, preventive maintenance program.

Standard 14: Discuss carpet construction and maintenance procedures. (1201.S.14)

Carpet Construction and Maintenance Procedures Objectives
Students will:
1201.14.1 Identify carpet types and durability factors.
1201.14.2 Identify primary and secondary backings used on carpets.
1201.14.3 Identify preventative measures and solutions for carpet wicking, shedding, pilling and mildew.

1201.14.4 Demonstrate how to use a floor plan and calendars to schedule routine and preventive carpet maintenance.
1201.14.5 Identify the types and functions of carpet care equipment.

1201.14.6 Demonstrate vacuuming procedures and dry powder cleaning methods.

1201.14.7 Identify applications for antimicrobial cleaning methods, electrostatic dissipation treatments and extraction techniques.

Standard 15: Address safety, chemical and security management in detail. (1201.S.15)

Safety, Chemical and Security Management Objectives
Students will:
1201.15.1 Identify potentially hazardous conditions present at a lodging property.
1201.15.2 Demonstrate safe use of ladders and electrical equipment.
1201.15.3 Store, handle and label chemicals properly.
1201.15.4 Analyze the safety of housekeeping jobs.
1201.15.5 Describe the concerns of using water to clean.
1201.15.6 Explain how to use bathroom cleaners safely.
1201.15.7 Identify common all-purpose cleaners and their additives.
1201.15.8 Compile the safety equipment needed when handling chemicals.
1201.15.9 List the five steps needed to comply with the HazComm standard.
1201.15.10 Create a hazardous chemicals list for the housekeeping department.
1201.15.11 Obtain Material Safety Data Sheets (MSDS) from chemical suppliers.
1201.15.12 List and explain possible housekeeping security risks.
1201.15.13 Define types of fires and create a safety training procedures plan.

Lodging Management II

The Lodging Management Program (LMP) is a two-year lodging curriculum developed by the Educational Institute of the American Hotel and Lodging Association with input from thousands of lodging professionals across the nation. The courses integrate academic and hands-on activities to provide an overview of the industry and competencies necessary for success in various areas of the lodging industry. Completers of the Lodging Management Program are eligible for a national certificate from the American Hotel and Lodging Association. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship.

Standard 1: Define various management styles and their functions. (1202. S.1)

Management Styles Objectives
Students will:

1202.1.1 List the challenges managers face in balancing the focus of management with the vision of leadership.
1202.1.2 Define empowerment.
1202.1.3 Distinguish between centralized and decentralized organizations.
1202.1.4 Illustrate why a manager's authority must equal the manager's responsibility.
1202.1.5 Define quality service, a guest's perceived value and moments of truth.
1202.1.6 Describe a manager's role and responsibility in quality guest service.
1202.1.7 Define diversity and the role that it plays for a hospitality manager.
1202.1.8 Summarize the Americans with Disabilities Act.
1202.1.9 Respond to potential sexual harassment issues.

Standard 2: Explain the role and necessity of excellent communication skills in the lodging industry. (1202.S.2)

Communication Skills Objectives
Students will:

1202.2.1 List the seven myths about communication.
1202.2.2 Identify ways that managers can improve their communication skills.
1202.2.3 Outline the barriers to effective communication.
1202.2.4 Outline tips for effective speaking and presentations (formal and informal).
1202.2.5 Use visual aids effectively.
1202.2.6 List techniques for active listening.
1202.2.7 Explain the importance of good business writing.
1202.2.8 List basic business writing rules.
1202.2.9 Write a standard business letter and business memorandum.

Standard 3: Possess a thorough knowledge of effective team building techniques. (1202.S.3)

Team Building Objectives
Students will:

1202.3.1 Define a team.
1202.3.2 Explain the stages of team development.
1202.3.3 Describe the roles of individuals as team members.
1202.3.4 Create a team using teambuilding techniques.

Standard 4: Prepare a personal career development plan. (1202.S.4)

Career Development Objectives
Students will:
1202.4.1 Discuss the importance of self-assessment.
1202.4.2 Recognize the reasons for self-marketing and personal promotion.
1202.4.3 Prepare for a first and second interview.
1202.4.4 Respond to job offers.

Standard 5: Discuss hospitality sales and marketing plans. (1202.S.5)

Sales and Marketing Plans Objectives
Students will:
1202.5.1 Explain the difference between marketing and sales.
1202.5.2 Identify the roles and responsibilities of the various positions in the sales and marketing department.
1202.5.3 Explain the four P's of marketing.
1202.5.4 Identify and define lodging market segments.

Standard 6: Will create a marketing plan. (1202.S.6)

Marketing Plan Objectives
Students will:
1202.6.1 Identify the components and list the steps used in developing a marketing plan.
1202.6.2 Perform a marketing audit.
1202.6.3 Explain target markets and positioning.
1202.6.4 Describe marketing objectives, action plans and evaluation procedures.

Standard 7: Explain the functions of a sales office at a lodging property. (1202.S.7)

Sales Office Objectives
Students will:
1202.7.1 List types of meetings and sales records.
1202.7.2 Explain the purpose of a function book and guest room control book.
1202.7.3 Discuss the various filing systems used in a sales office.
1202.7.4 Explain the role of automated systems used to make lists, reports, analyze applications and to provide client information.

Standard 8: Explain the purpose and functions of the banquet and meeting room sales departments. (1202.S.8)

Banquet and Meeting Room Sales Departments Objectives
Students will:
1202.8.1 Outline the basic responsibilities and duties of banquet department employees.
1202.8.2 Explain types of advertising and promotion used in the banquet department.
1202.8.3 Identify the different types of food and beverage sales at a lodging property.
1202.8.4 List types of meeting rooms and meeting room set-ups.
1202.8.5 Book and manage the meeting room functions of a lodging property.

Standard 9: Explain why selling is everyone's responsibility. (1202.S.9)

Selling Objectives
Students will:
1202.9.1 Identify the importance of training and motivating an employee "to sell" the property's

products and services.

1202.9.2 Discuss the importance of relationship selling.

1202.9.3 Describe what is meant by upgrading, suggestive selling and cross selling.

1202.9.4 Illustrate the roles of switchboard operators, reservationists, front desk personnel and food and beverage employees in sales. .

Standard 10: Describe the various telephone sales methods. (1202.S.10)

Telephone Sales Objectives

Students will:

1202.10.1 Explain the basis of effective telephone communication.

1202.10.2 Make sales, promotional, service and public relations calls.

1202.10.3 List and explain the various types of incoming calls.

1202.10.4 Describe a telephone sales blitz.

1202.10.5 Explain the necessary steps in setting up a telemarketing program.

Standard 11: Describe the relationship between hotels and the food service industry. (1202.S.11)

Relationship Between Hotels and Food Service Objectives

Students will:

1202.11.1 List and describe the different types of food service operations and the markets that they serve.

1202.11.2 List the primary departments in a large hotel and define their roles and responsibilities.

1202.11.3 Identify various positions held in the food and beverage department and define their individual roles and responsibilities.

1202.11.4 Explain the critical role of food sanitation practices in food and beverage operations.

Standard 12: Demonstrate the importance of menu knowledge to the food and beverage operations. (1202.S.12)

Food and Beverage Operations Objectives

Students will:

1202.12.1 Describe menu styles and schedules.

1202.12.2 List and explain menu types.

1202.12.3 Explain the importance of menu planning, menu design and menu pricing.

Standard 13: Discuss the structure and scope of dining and beverage service. (1202.S.13)

Dining and Beverage Service Objectives

Students will:

1202.13.1 Identify dining service staff positions.

1202.13.2 Define dining service styles and procedures.

1202.13.3 List the factors that describe superior guest service.

1202.13.4 Identify Beverage Service Procedures.

1202.13.5 Explain the components of responsible beverage service.

Standard 14: Discuss the concepts of casual/theme restaurants. (1202.S.14)

Casual/Theme Restaurants Objectives

Students will:

1202.14.1 Explain what is meant by a marketing perspective.

1202.14.2 Describe how managers set quality standards and deal with training issues.

1202.14.3 List typical dining service staff positions and explain their roles and responsibilities.

1202.14.4 Identify the steps used in the delivery of guest service.

Standard 15: Book and plan banquets and catered events. (1202.S.15)

Banquets and Catered Events Objectives

Students will:

1202.15.1 Identify elements of a contract or letter of agreement and provide an example of each.
1202.15.2 Set up a function room and prepare the staff schedule for the event.
1202.15.3 Prepare, plate, hold and serve food at an event.
1202.15.4 Identify challenges for delivery service at a function.
1202.15.5 Discuss protocol issues.
1202.15.6 Explain payment plan options for banquets and catered events.
1202.15.7 Discuss the importance of customer feedback after delivery of service.

Standard 16: Explain the purpose and functions of room service operations. (1202.S.16)

Room Service Operations Objectives

Students will:

1202.16.1 List the key elements of a well-managed room service operation.
1202.16.2 Evaluate staffing issues and the role of forecasting in staff scheduling.
1202.16.3 Demonstrate how to take, route, prepare, deliver and follow-up room service orders.

Standard 17: Complete a 400-hour, off-campus, paid internship in a lodging property. (1202.S.17)

Paid Internship Objectives

Students will:

1202.17.1 Develop task performance necessary for success in each functional area as described in the LMP workplace competency checklist.
1202.17.2 Develop work habits necessary for success in each functional area as described in the LMP workplace competency checklist.
1202.17.3 Develop the applied knowledge necessary for success in each functional area as described in the LMP workplace competency checklist.

Advertising

This course focuses on the purpose of the promotional strategy of advertising and its role in the marketing environment. Emphasis is placed on the different types of print, broadcast and specialty media, and the advantages and disadvantages of each type. This course will also give an overview of other promotional tools used in the marketing arena.

Standard 1: Fundamentals of Marketing (0401.S.1)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
Students will:
0401.1.1 Define the role of marketing and its importance.
0401.1.2 Explain the functions of marketing.
0401.1.3 State the marketing concept.
0401.1.4 Describe the economic benefits of marketing.
0401.1.5 Identify the 4 P's of the marketing mix.
0401.1.6 Illustrate the use of product positioning.
0401.1.7 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0401.1.8 Construct a customer profile.

Standard 2: Promotion (0401.S.2)
Define Promotion.

Promotion Objectives
Students will:
0401.2.1 Explain the role of promotion.
0401.2.2 Explain the concept of the promotional mix.
0401.2.3 Develop a promotional plan.
0401.2.4 Evaluate ethical standards of various promotional media.
0401.2.5 Distinguish between advertising, publicity, sales promotion and visual merchandising.

Standard 3: Advertising as a Promotional Tool (0401.S.3)
Explore Advertising as a Promotional Tool.

Advertising as a Promotional Tool Objectives
Students will:
0401.3.1 Identify the characteristics and benefits of advertising.
0401.3.2 Explore advertising careers.
0401.3.3 Explore the history of advertising.
0401.3.4 Differentiate between the roles of an advertising agency and an in-house advertising department.
0401.3.5 Describe how the advertising agency industry is regulated.

Standard 4: Advertising Media (0401.S.4)
Analyze Various Types of Advertising Media.

Advertising Media Objectives
Students will:
0401.4.1 Identify the various types of media.

0401.4.2 Analyze the advantages and disadvantages of each type of media.
0401.4.3 Select the appropriate media for the target market.
0401.4.4 Identify standards for selecting advertising media.
0401.4.5 Evaluate the effectiveness of advertising media.

Standard 5: Advertising Budget (0401.S.5)
Describe the Purpose of an Advertising Budget.

Advertising Budget Objectives
Students will:
0401.5.1 Identify methods of advertising budgeting.
0401.5.2 Calculate media costs.
0401.5.3 Develop a budget.
0401.5.4 Develop an advertising schedule.
0401.5.5 Explain the role of advertising as an investment.
0401.5.6 Explain placement costs for print and broadcast advertisements.

Standard 6: Advertisement Development (0401.S.6)
Develop Advertisements.

Advertisement Development Objectives
Students will:
0401.6.1 Identify the parts of a print advertisement.
0401.6.2 Create advertising headlines.
0401.6.3 Write advertising body copy.
0401.6.4 Analyze illustrations.
0401.6.5 Choose appropriate styles of typeface.
0401.6.6 Explain the levels of Maslow's Hierarchy of needs.
0401.6.7 Illustrate the types of eye flow patterns.
0401.6.8 Differentiate between the optical center and focal point.
0401.6.9 Explain the steps of developing print advertisements.
0401.6.10 Develop an advertisement layout.
0401.6.11 Develop a television storyboard.
0401.6.12 Write a radio commercial.
0401.6.13 Explain the psychological use of lines.
0401.6.14 Demonstrate the use of color in advertising.
0401.6.15 Create a slogan, logo and signature.
0401.6.16 Describe how to check advertising proofs.

Standard 7: Visual Merchandising as a Promotional Tool (0401.S.7)
Create a Visual Merchandising Display.

Visual Merchandising Objectives
Students will:
0401.7.1 Identify the characteristics and benefits of visual merchandising.
0401.7.2 Identify window and interior display arrangements.
0401.7.3 Illustrate types of display patterns of arrangements.
0401.7.4 Explain how exterior and interior features contribute to the store's image.
0401.7.5 Identify the artistic considerations in display preparations.
0401.7.6 Select display fixtures.
0401.7.7 Design a display sign.
0401.7.8 Select merchandise for display.

0401.7.9 Create a display.
0401.7.10 Describe the procedures for maintaining and dismantling displays.

Standard 8: Public Relations/Publicity as a Promotional Tool (0401.S.8)
Define Public Relations/Publicity as a Promotional Tool.

Public Relations/Publicity Objectives
Students will:
0401.8.1 Identify the characteristics and benefits of public relations.
0401.8.2 Identify the audiences for public relations.
0401.8.3 Explain the importance of company participation in community activities.
0401.8.4 Write a media release.

Standard 9: Technology (0401.S.9)
Explore the Use of Technology in Promotion.

Technology Objectives
Students will:
0401.9.1 Identify technology-based promotion.
0401.9.2 Utilize software applications in the development of promotional tools.

Standard 10: Sales Promotion as a Promotional Tool (0401.S.10)
Define Sales Promotion as a Promotional Tool.

Sales Promotion Objectives
Students will:
0401.10.1 Identify the characteristics and benefits of sales promotion.
0401.10.2 Differentiate between the various types of sales promotion.
0401.10.3 Analyze the advantages and disadvantages of the various types of sales promotion.
0401.10.4 Select appropriate sales promotion.
0401.10.5 Develop a sales promotion.
0401.10.6 Evaluate the effectiveness of a sales promotion.
0401.10.7 Justify the need for sponsorship.

Economics of Business

This course focuses on the impact of economics as it relates to businesses and individuals. Because businesses are part of the overall economy, the success of any individual business is strongly affected by events in the economy as a whole. In addition, the economy as a whole is affected by the actions of the individual members within it.

Standard 1: Economic Principles (0404.S.1)
Describe the importance of economic principles in today's society.

Economic Principles in Today's Society Objective
Students will:
0404.1.1 Identify opportunity costs and trade-offs involved in making choices about how to use scarce economic resources.
0404.1.2 Give examples of economic wants and needs.
0404.1.3 Identify the resources (factors of production) that are used to satisfy wants and needs.
0404.1.4 Define economic goods and services.
0404.1.5 Explain how the concept of scarcity affects the availability of economic goods and services.

Standard 2: Productivity, Specialization and Division of Labor Change (0404.S.2)
Explain the importance of productivity and discuss how specialization and division of labor change productivity.

Productivity, Specialization and Division of Labor Change Objective
Students will:
0404.2.1 Analyze the methods of increasing productivity.
0404.2.2 Demonstrate specialization and division of labor.
0404.2.3 Explain how the relationship of input to output affects the level of productivity.

Standard 3: Basic Economic Systems Differences (0404.S.3)
Explain why societies develop economic systems and identify the basic features of different economic systems.

Basic Economic Systems Differences Objectives
Students will:
0404.3.1 Explain why a society needs an economic system.
0404.3.2 Discuss advantages and disadvantages of different types of economic systems.
0404.3.3 Discuss how an economic system addresses the questions what is to be produced, how it is to be produced, and for whom.

Standard 4: Role of Core U.S. Economic Institutions and Incentives (0404.S.4)
Explain the role of core economic institutions and incentives in the U.S. economy.

Core U.S. Economic Institutions and Incentives Objective
Students will:
0404.4.1 Describe the concept of profit in the free enterprise system.
0404.4.2 Provide examples of economic institutions and incentives.
0404.4.3 Analyze reasons why a society's allocation of resources will be affected by its laws, public policy, and taxation.

Standard 5: Role of Exchange and Money (0404.S.5)
Explain the role of exchange and money in an economic system and describe the effect of interdependence on economic activity.

Role of Exchange and Money Objective
Students will:
0404.5.1 Demonstrate the concept of barter.
0404.5.2 Explain why and illustrate how money can contribute to an increased number of exchanges, greater specialization and interdependence, and a higher standard of living in an economy.

Standard 6: Role of Supply and Demand as related to Markets and Prices in the U.S (0404.S.6)
Describe the role of law of supply and demand in the U.S. economy.

Role of Markets and Prices in the U.S. Economy Objective
Students will:
0404.6.1 Define the concept of supply and demand.
0404.6.2 Analyze prices as determined by supply and demand.
0404.6.3 Identify determinants of supply and demand for goods and services.
0404.6.4 Describe how relative prices affect buying and selling decisions of producers and consumers.
0404.6.5 Graph the concept of price on a supply and demand curve.

Standard 7: Types of Competitive Structures and Markets (0404.S.7)
Describe different types of competitive structures and illustrate the role of competitive markets in the U.S. and other economies.

Types of Competitive Structures and Markets Objective
Students will:
0404.7.1 Explain how competition among sellers affects prices and profits.
0404.7.2 Determine the role of government in preventing private monopolies and regulating public monopolies.
0404.7.3 Research U.S. laws and government regulations that are designed to maintain competition.
0404.7.4 Compare and contrast price and non-price competition.

Standard 8: Personal Financial Resources and Consumer Decisions (0404.S.8)
Manage limited personal financial resources and recognize that more of the wants and needs of members of a society can be satisfied if wise consumer decisions are made.

Personal Financial Resources and Consumer Decisions Objective
Students will:
0404.8.1 Analyze the consumer decision making process for products and explain why there is variance in price for a given item bought from different suppliers.
0404.8.2 Use published consumer resources to collect information for making buying decisions.
0404.8.3 Identify sources and types of credit.
0404.8.4 Calculate the cost of credit.
0404.8.5 Develop a plan to allocate financial resources to meet an individual's financial goals.
0404.8.6 Describe the advantages and disadvantages of different saving and investing plans.
0404.8.7 Identify services that financial institutions provide to customers.
0404.8.8 Perform the steps involved in opening and using a checking account.
0404.8.9 Reconcile a bank statement.

Standard 9: U.S. Economy Functions and Measures (0404.S.9)
Explain how the U.S. economy functions as a whole and describe economic measures of economic activity such as gross domestic product, unemployment and inflation.

U.S. Economy Functions and Measures of Activities Objective
Students will:
0404.9.1 Explain the Consumer Price Index.
0404.9.2 Analyze the factors that affect Gross Domestic Product.

Standard 10: Role of Government in an Economic System (0404.S.10)
Discuss the role of government in an economic system, especially the necessary and desirable role of government in the U.S. economy.

Role of Government in an Economic System Objectives
Students will:
0404.10.1 Explain how government taxation affects consumers and producers.
0404.10.2 Define and give examples of progressive, regressive, and proportional taxes.
0404.10.3 Analyze the effect of national debt on the level of economic activity.

Standard 11: U.S. Economy Citizens Rights and Responsibilities (0404.S.11)
Describe rights and responsibilities of citizens in the U.S. economy.

U.S. Economy Citizens Rights and Responsibilities Objective
Students will:
0404.11.1 Identify consumer rights.
0404.11.2 Describe how legislation defines and protects consumer rights.
0404.11.3 Examine how society's needs are balanced against the individual's rights and responsibilities.
0404.11.4 Explain how consumer legislation affects product.
0404.11.5 Distinguish between fraudulent, misleading, and legitimate product claims.

Standard 12: Economic Relationships Among Nations (0404.S.12)
Examine the importance of economic relationships among nations and discuss the role of international trade and investment and international monetary relations in the global economy.

Economic Relationships Among Nations Objectives
Students will:
0404.12.1 Explain the importance of imports and exports in a global economy.
0404.12.2 Identify examples of goods and services that imported and exported.
0404.12.3 Explain foreign exchange rates and why the value of currency changes.
0404.12.4 Explain the advantages and disadvantages of free trade agreements between and among nations.

Fashion Marketing

This course is designed for students to gain basic knowledge of the fashion marketing industry and provide the learner with skills for a career in the field of Fashion Marketing.

Standard 1: Nature of Fashion (0407.S.1)
Explore the Nature of Fashion.

Nature of Fashion Objectives
Students will:
0407.1.1 Explain the concept of fashion in terms of apparel, home fashion and accessories.
0407.1.2 Explain the components of fashion.

Standard 2: Fundamentals of Marketing (0407.S.2)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
Students will:
0407.2.1 Define the role of marketing and its importance.
0407.2.2 List examples of marketing functions and related activities.
0407.2.3 Differentiate between the concepts of marketing segmentation, niche and mass marketing.
0407.2.4 Identify the elements of the marketing mix.
0407.2.5 Demonstrate the flow of products in the channel of distribution.
0407.2.6 State the marketing concept.

Standard 3: History and Trends of Fashion (0407.S.3)
Explore the History and Trends of Fashion.

History and Trends of Fashion Objectives
Students will:
0407.3.1 Research and describe the theories of the origin of fashion.
0407.3.2 Describe the influence of historical events on fashion.
0407.3.3 Analyze the influences that economic, culture, social, political, geographic and psychological factors have on fashion.
0407.3.4 Explain the use and importance of fashion cycles.
0407.3.5 Differentiate between fashion trends, fads and classics.
0407.3.6 Identify current trends in fashion.

Standard 4: Color and Design Fundamentals (0407.S.4)
Analyze Color and Design Fundamentals.

Color and Design Fundamentals Objectives
Students will:
0407.4.1 Describe elements and principles of line and design.
0407.4.2 Discuss how to use design to create illusions that enhance appearance.
0407.4.3 Analyze standardized sizing in the fashion industry.
0407.4.4 Explain the principles of color psychology and symbolism and its relationship to fashion.
0407.4.5 Identify purpose of color wheel and analyze color schemes.

Standard 5: Textile Characteristics (0407.S.5)
Evaluate Textile Characteristics.

Textile Characteristics Objectives
Students will:
0407.5.1 Identify the characteristics of natural and man-made fibers.
0407.5.2 Describe the relationship between fabric characteristics and product use.
0407.5.3 Identify the most common fabric constructions.

Standard 6: Economic Principles as Related to the Fashion Industry (0407.S.6)
Describe the Importance of Economic Principles as it relates to the Fashion Industry.

Economic Principles Objectives
Students will:
0407.6.1 Differentiate between goods and services.
0407.6.2 Discuss advantages and disadvantages of the different types of economic systems.
0407.6.3 Explain the concept of profit.
0407.6.4 Discuss the benefits of competition.
0407.6.5 Analyze the law of supply and demand.
0407.6.6 Examine the relationship between cost and price.
0407.6.7 Explain utility.

Standard 7: Communication Skills (0407.S.7)
Enhance Communication Skills.

Communication Skills Objectives
Students will:
0407.7.1 Explain the importance of verbal and nonverbal communication.
0407.7.2 Demonstrate proper telephone communication skills.
0407.7.3 Use effective writing skills.

Standard 8: Customer Service Skills (0407.S.8)
Develop Customer Service Skills.

Customer Service Skills Objectives
Students will:
0407.8.1 Explain the importance of customer service as it relates to a retail business.
0407.8.2 Demonstrate procedures for handling customer complaints.
0407.8.3 Handle multiple tasks simultaneously.
0407.8.4 Interpret company policies to customers.

Standard 9: Principles of Selling (0407.S.9)
Apply the Principles of Selling.

Principles of Selling Objectives
Students will:
0407.9.1 Identify the steps in the selling process.
0407.9.2 Identify and explain the different approaches of opening a sale.
0407.9.3 Conduct a sales presentation for a product or service.
0407.9.4 Choose the proper method of handling objections in order to close a sale.
0407.9.5 Identify and explain the different types of closing a sale.
0407.9.6 Explore various sales careers in the fashion industry.

0407.9.7 Apply textile knowledge to a sales presentation.

Standard 10: Careers in Fashion Marketing (0407.S.10)
Research Careers in Fashion Marketing.

Careers in Fashion Marketing Objectives
Students will:
0407.10.1 Identify personal traits important in a fashion career.
0407.10.2 Identify career opportunities in fashion sales, textiles and manufacturing industries.
0407.10.3 Identify an acceptable fashion image for work, school and social activities.

Standard 11: Technology in the Fashion Industry (0407.S.11)
Explore Technology in the Fashion Industry.

Fashion Industry Technology Objectives
Students will:
0407.11.1 Investigate computer technology applications in fashion marketing.
0407.11.2 Identify computer technology used in fashion/fabric design and production.

Standard 12: Principles of Promotion (0407.S.12)
Demonstrate the Principles of Promotion.

Principles of Promotion Objectives
Students will:
0407.12.1 Identify the elements of the promotional mix in fashion marketing.
0407.12.2 Analyze types of media used in fashion retail advertising.
0407.12.3 Identify the parts of a print advertisement.
0407.12.4 Prepare a broadcast advertisement.
0407.12.5 Analyze visual merchandising displays using the elements of display arrangements, color schemes, display background, mannequins and lighting.

Standard 13: Workplace Skills (0407.S.13)
Develop Job-Seeking, Job-Keeping and Job Learning Skills for the Workplace.

Job-Seeking, Job-Keeping and Job Learning Objectives
Students will:
0407.13.1 Explain the concept of work ethics.
0407.13.2 Explain the importance of positive working relationships and employer expectations.
0407.13.3 Complete the procedures for obtaining employment (resume, cover letter, job application, job search, interview, follow-up letter).

Standard 14: Risk Management (0407.S.14)
Explore Risk Management.

Risk Management Objectives
Students will:
0407.14.1 Identify the impact of internal theft and shoplifting.
0407.14.2 Demonstrate basic safety rules relevant to job safety.
0407.14.3 Describe the first aid measures to be used in case of an emergency or accident.
0407.14.4 Classify type A, B, and C fires and describe their characteristics in order to extinguish them properly.

Standard 15: Inventory Control Procedures (0407.S.15)
Describe Inventory Control Procedures.

Inventory Control Procedure Objectives
Students will:
0407.15.1 Describe the importance of inventory control.
0407.15.2 Describe receiving procedures.
0407.15.3 Explain procedures used to issue items and keep track of inventory.

Standard 16: Fashion Market Centers and Designers (0407.S.16)
Identify Fashion Market Centers and Designers.

Fashion Market Centers and Designers Objectives
Students will:
0407.16.1 Identify domestic fashion market centers.
0407.16.2 Identify international fashion market centers.
0407.16.3 Recognize influential fashion designers.

International Business and Marketing

This course is for students with a career interest in the field of international trade or for students who intend to pursue a business/marketing degree. This course provides students with an understanding of the various careers in international trade, finance and marketing. Fundamental concepts, principles, and theories of marketing in an international setting are considered.

Standard 1: Role of International Business (0410.S.1)
Explain the Role of International Business.

Role of International Business Objectives
Students will:

0410.1.1 Identify examples of international trade in the local and state community.
0410.1.2 Describe the impact of international business activities on the local, regional and national levels.
0410.1.3 Analyze the impact of a domestic company involving itself in international trade opportunities.
0410.1.4 Describe the resources (e.g., ports, trade routes, transportation centers, foreign trade zones and natural, financial, and human resources) of major cities around the world.
0410.1.5 Identify business opportunities in countries in various levels of economic development.

Standard 2: Communication Strategies (0410.S.2)
Apply Communication Strategies in International Business Relations.

Communication Strategies Objectives
Students will:

0410.2.1 Compose effective business communications.
0410.2.2 Analyze international business blunders resulting from ineffective or incorrect communication patterns.
0410.2.3 Identify international cultural differences in food, dress, social behaviors and language.
0410.2.4 Compare business protocol of various countries.
0410.2.5 State examples of non-verbal communication affecting international businesses.

Standard 3: Social, Cultural, Political, Legal, and Economic Factors (0410.S.3)
Describe Factors That Shape and Impact the International Business Environment.

Social, Cultural, Political, Legal and Economic Factors that Impact the International Business Environment Objectives
Students will:

0410.3.1 Identify distinctive social and cultural factors affecting business activities (e.g. time, workday, workweek, schedules, holidays).
0410.3.2 Describe how trade barriers, tariffs, quotas and taxation policies affect choice of location for companies operating internationally.
0410.3.3 Recognize legal differences that exist between and among countries in areas such as consumer protection, product guidelines, labor laws, contract formulation, liability and taxation.
0410.3.4 Define terms such as GDP (GNP), balance of trade, foreign debt and cost of living.
0410.3.5 Analyze the availability of resources and economic potential in various countries.
0410.3.6 Identify the economic systems used to decide what to produce, how it is produced, and for whom it is produced in a country.
0410.3.7 Evaluate the competitive strengths and weaknesses faced by a company involved in international business.

Standard 4: International Finance and Risk Management (0410.S.4)
Explain the Role, Importance, and Concepts of International Finance and Risk Management.

International Finance and Risk Management Objectives
Students will:

0410.4.1 Explain how currency exchange rates affect companies.
0410.4.2 Identify risks associated with international trade.

Standard 5: Operations and Management of Human Resources (0410.S.5)
Address the Operations and Management of Human Resources.

Operations and Management of Human Resources Objectives
Students will:

0410.5.1 Describe the production processes used to create goods and services in different countries.
0410.5.2 Discuss factors that influence the type of merchandise/inventory control systems used by companies operating internationally.
0410.5.3 Identify the factors that influence the application of managerial styles in different countries.
0410.5.4 Describe how compensation and employee benefits differ in various cultures.
0410.5.5 Identify how differences in occupational health and safety standards impact the conduct of business internationally.

Standard 6: Marketing Concepts (0410.S.6)
Apply Marketing Concepts to International Business:

Marketing Concepts Objectives
Students will:

0410.6.1 Describe how a company markets a product/service in other countries.
0410.6.2 Illustrate how social, cultural, technological and geographic factors influence consumer buying behavior in different countries.
0410.6.3 Evaluate market potential for a good or service in a foreign market.
0410.6.4 Describe how the marketing mix elements need to be adapted for international marketing efforts.
0410.6.5 Analyze buying patterns of consumers in a foreign market.
0410.6.6 Explain how the marketing research process, including data collection, differs in an international application.
0410.6.7 Give examples of countries that have absolute and comparative advantage.
0410.6.8 Explain how brands and packages are affected by culture.
0410.6.9 Explain how the business environment affects prices charged in foreign markets.
0410.6.10 Select distribution channels for a company involved in international business.
0410.6.11 Discuss media used in different foreign markets.
0410.6.12 Analyze the influence of social and cultural factors affecting promotions used in foreign markets.

Standard 7: Trade Concepts in the Import/Export Process (0410.S.7)
Relate Balance of Trade Concepts to the Import/Export Process.

Trade Concepts Objectives
Students will:

0410.7.1 Identify goods and services imported to or exported from a country.
0410.7.2 Analyze the import or export potential for a good or service.
0410.7.3 Describe the role that U.S. Customs and the customs agencies of other countries play in international trade activities.
0410.7.4 Define why trade barriers are imposed by governments (such as quotas, tariffs, licensing

requirements, exchange rate controls).

0410.7.5 Describe international trade agreements (e.g., GATT, NAFTA).

Standard 8: Business Ownership and Entrepreneurial Opportunities (0410.S.8)

Identify Forms of Business Ownership and Entrepreneurial Opportunities.

Forms of Business Ownership and Entrepreneurial Opportunities Objectives

Students will:

0410.8.1 Analyze various forms of business ownership (e.g., sole proprietorship, corporation, partnership) for different international business situations.

0410.8.2 Determine social and cultural influences on the form of business ownership used or reuired in different countries.

0410.8.3 Identify potential new international business ventures for locally based companies.

0410.8.4 Distinguish between licensing and franchising for international business activities.

Standard 9: Technology in International Business. (0410.S.9)

Identify Technology Utilized in International Business.

Technology in International Business Objectives

Students will:

0410.9.1 Describe how the use of technology impacts the global market.

0410.9.2 Identify global e-commerce legal issues.

Introduction to Business and Marketing

This course is an introduction course that explores careers in business and marketing, the role of marketing in today's business world and a broad overview of economics.

Standard 1: Careers in Business and Marketing (0413.S.1)
Explore Careers in Business and Marketing.

Careers Objectives
Students will:
0413.1.1 Research and present information regarding careers in business and marketing.
0413.1.2 Explain how economic trends affect employment in business and marketing careers.
0413.1.3 Complete an interest survey to determine potential career options.

Standard 2: Private Enterprise System (0413.S.2)
Define and Explain How the Market Works in a Private Enterprise System.

Private Enterprise Objectives
Students will:
0413.2.1 Explore the benefits businesses provide to the economy.
0413.2.2 Compare and contrast the private enterprise system with other economic systems.
0413.2.3 Distinguish between consumer needs and wants and how they are satisfied.
0413.2.4 Explain how consumers affect the supply and demand for goods and services.
0413.2.5 Explain how prices affect consumers and producers.
0413.2.5 Describe the economic resources used in the production of goods and services.
0413.2.6 Identify and discuss economic measurements.
0413.2.7 Describe the four phases of the business cycle.

Standard 3: Social and Ethical Environment of Business (0413.S.3)
Explore Polices of a Diverse Workforce in Business and Marketing.

Social and Ethical Environment Objectives
Students will:
0413.3.1 Describe reasons for layoffs and downsizing.
0413.3.2 Write a job description.
0413.3.3 Discuss on-the-job policies dealing with diversity, drug use on the job, theft in the workplace and sexual harassment.
0413.3.4 Identify the functions, levels and responsibilities of managers.
0413.3.5 Discuss the pros, cons and implications of unionization.
0413.3.6 Explain what is meant by the social responsibilities of business.

Standard 4: Financial Management (0413.S.4)
Demonstrate the Handling of Business Finances.

Financial Management Objectives
Students will:
0413.4.1 Explain the types and purposes of financial statements.
0413.4.2 Describe the responsibilities of the Federal Reserve System.
0413.4.3 Calculate interest and finance charges.
0413.4.4 Identify the purpose, process and implications of obtaining credit.
0413.4.5 Identify laws that protect the consumer when applying for credit.
0413.4.6 Prepare a personal budget.

0413.4.7 Reconcile a bank statement.
0413.4.7 Obtain information regarding services provided by a financial institution.
0413.4.8 Identify the purpose and types of insurance.

Standard 5: Role of Marketing (0413.S.5)
Define the Role of Marketing in Today's World.

Role of Marketing Objectives
Students will:
0413.5.1 Apply the four elements of the marketing mix to products and services.
0413.5.2 Identify the stages of the product life cycle.
0413.5.3 Determine the appropriate channel of distribution for products.
0413.5.4 Identify the steps of pricing.
0413.5.5 Identify the functions of marketing.

Standard 6: Business Structure
Explore Development and Maintenance of a Business.

Business Structure Objectives
Students will:
0413.6.1 Identify unique characteristics of an entrepreneur.
0413.6.2 Compare and contrast the advantages and disadvantages of the types of business ownerships.
0413.6.3 Discuss the opportunities available to an entrepreneur.
0413.6.4 Identify the parts of a business plan and the components.

Standard 7: Government and Business Relationships (0413.S.7)
Explore the Relationship Between Government and Business.

Relationship Between Government and Business Objectives
Students will:
0413.7.1 Examine regulations that are encountered when starting a small business.
0413.7.2 Distinguish between progressive, proportional and regressive taxes.

Standard 8: International Business (0413.S.8)
Define the Importance of International Business in the Market Place.

International Business Objectives
Students will:
0413.8.1 Discuss the pros and cons of free trade.
0413.8.2 List examples of United States imports and exports.
0413.8.3 Identify specific products that currently are subject to government trade policies.
0413.8.4 Compare and contrast the economic systems.
0413.8.5 Identify benefits and challenges to competition in the international marketplace.

Standard 9: Role of a Consumer (0413.S.9)
Identify the Role of a Consumer in Business and Marketing.

Role of a Consumer Objectives
Students will:
0413.9.1 Describe choices consumers make when buying goods and services.
0413.9.2 Discuss the basic rights and responsibilities of a consumer.
0413.9.3 Research why regulations are implemented and the effects the regulations have on consumer safety.

Management and Entrepreneurship

This course provides a background for the development and operation of a business starting with the role of the entrepreneur in our economy to the development of a business plan and the application of specific marketing skills and concepts within the business environment. This course also explores the planning, organizing and controlling of a business, including organizational and human aspects, with emphasis on various theories of management, the knowledge and understanding necessary for managing people and functions, and decision making.

Standard 1: Careers in Supervision and Management (0416.S.1)
Explore the career of a supervisor/manager.

Supervision and Management Career Objectives
Students will:

0416.1.1 Identify unique characteristics of an entrepreneur.
0416.1.2 Compare and contrast the scientific management, functional, human relations/behavioral school and quantitative approaches of management.
0416.1.3 Identify the characteristics of a successful supervisor/manager.
0416.1.4 Identify and discuss the major demographic and societal trends that will affect supervisors/managers in the future.
0416.1.5 Summarize the difficulties supervisors/managers face in fulfilling managerial roles.

Standard 2: Managerial Functions of Supervision (0416.S.2)
Apply the managerial functions to a supervisor or manager's role.

Managerial Function Objectives
Students will:

0416.2.1 Describe and apply the basic steps of the decision-making process.
0416.2.2 Discuss the functions utilized in management.
0416.2.3 Write a mission statement for a business or department.
0416.2.4 Identify examples of strategic plans, tactical plans and operational plans.
0416.2.5 Explain the concept of a chain of command.

Standard 3: Management Communication Skills (0416.S.3)
Explain the importance of effective communication in the manager's role.

Effective Communication Objectives
Students will:

0416.3.1 Define communication and discuss its implication for effective management in the manager's role.
0416.3.2 Diagram the communication process and explain the importance of each component to the process.
0416.3.3 Identify barriers to communication and suggest methods to overcome those barriers.
0416.3.4 Compare and contrast the formal, informal, horizontal and vertical channels of communication.
0416.3.5 Demonstrate effective communication skills.

Standard 4: Employee Motivation (0416.S.4)
Apply employee motivational factors to the manager's role.

Employee Motivation Objectives
Students will:

0416.4.1 Compare various motivation theories and explain their importance for understanding employee behavior.
0416.4.2 Analyze the application of Theory X and Theory Y in motivating employees.
0416.4.3 Classify motivational factors according to Maslow's hierarchy of needs.
0416.4.4 Define job rotation, job enlargement, and job enrichment and their implications in motivating employees.
0416.4.5 Investigate the significance of Total Quality Management (TQM).
0416.4.6 Explain the concept of authority, responsibility and power as a requirement of any managerial position.
0416.4.7 Define delegation, responsibility and accountability and describe their relationship with one another.

Standard 5: Entrepreneurship (0416.S.5)
Explore the role of an entrepreneur.

Entrepreneur Objectives
Students will:
0416.5.1 Compare and contrast the advantages and disadvantages of the types of ownership.
0416.5.2 Identify entrepreneurial opportunities.
0416.5.3 Analyze the parts of a business plan and components included in each part.
0416.5.4 Write and present a business plan for a small business.

Standard 6: Marketing Plan (0416.S.6)
Write a marketing plan for a small business.

Marketing Plan Objectives
Students will:
0416.6.1 Complete a demographic study to determine a market.
0416.6.2 Determine market potential.
0416.6.3 Identify direct and indirect competition.
0416.6.4 Evaluate competitive strengths and weaknesses.
0416.6.5 Explain the importance of choosing a proper location for a business.
0416.6.6 Describe the different types of goods and services.
0416.6.7 State the marketing concept.
0416.6.8 Utilize market segmentation and target marketing.
0416.6.9 Identify and apply the components of the marketing mix.
0416.6.10 Evaluate the importance of price.
0416.6.11 Describe different pricing strategies.
0416.6.12 Calculate price.
0416.6.13 Describe the steps in the selling process.

Standard 7: Financial Plan (0416.S.7)
Write a financial plan for a small business.

Financial Plan Objectives
Students will:
0416.7.1 Analyze the components of a financial plan.
0416.7.2 Compute capital needs.
0416.7.3 Prepare financial statements (income statement, balance sheet, statement of cash flow).
0416.7.4 Analyze financial statements to ascertain financial health of a business.
0416.7.5 Identify parts of an accounting system.

0416.7.6 Write a personal resume.
0416.7.7 Calculate personal net worth.
0416.7.8 Identify personal/financial assets available to collateralize.
0416.7.9 List potential sources of funds for a business.

Standard 8: Management Plan (0416.S.8)
Write a management plan for a small business.

Management Plan Objectives
Students will:
0416.8.1 Compare and contrast types of business ownership.
0416.8.2 Develop an organizational chart.
0416.8.3 Explain how small businesses recruit effectively.
0416.8.4 Prioritize staffing needs.
0416.8.5 Identify motivational techniques for employees.
0416.8.6 Explain employment laws.
0416.8.7 Monitor results of revenue and explain its impact on inventory, personnel, insurance and promotion.
0416.8.8 Analyze inventory procedures.
0416.8.9 Identify resources available for small business assistance.
0416.8.10 Identify government regulations.
0416.8.11 Research business risks and prevention control.
0416.8.12 List and explain components of a legally enforceable contract.
0416.8.13 Discuss business ethics and social responsibility.

Marketing Principles I

This course includes instructional areas designed to provide an understanding of the fundamental marketing processes and the role of marketing in a free enterprise economy.

Standard 1: Marketing Education and Cooperative Procedures (0422.S.1)
Demonstrate Knowledge of Marketing Education and Cooperative Procedures.

Marketing Education and Cooperative Procedures Objectives
Students will:
0422.1.1 Explain the three components of a marketing education program.
0422.1.2 Participate in a simulated business activity.

Standard 2: Human Relation Skills (0422.S.2)
Demonstrate Effective Human Relations Skills.

Human Relations Objectives
Students will:
0422.2.1 Demonstrate the nature of positive consumer/client relations for personal and business success.
0422.2.2 Exhibit appropriate personal appearance, positive attitude, enthusiasm, initiative and behavior in the classroom and in the workplace.
0422.2.3 Demonstrate self-control while handling difficult customers/clients.
0422.2.4 Develop gender-free attitudes about participation in activities in the workplace.
0422.2.5 Analyze self-understanding and self-esteem in the motivation of employees.
0422.2.6 Demonstrate self-control in the handling of customer complaints.
0422.2.7 Set personal goals for the future.
0422.2.8 Use time management principles in creating a schedule of activities.

Standard 3: Job-Seeking, Keeping and Learning Skills (0422.S.3)
Develop Job-Seeking, Job-Keeping and Job Learning Skills for the Workplace.

Job-Seeking, Keeping and Learning Skill Objectives
Students will:
0422.3.1 Explore various marketing occupations.
0422.3.2 Complete the procedures for obtaining employment (resume, cover letter, job application, job search, interview, follow-up letter).
0422.3.3 Identify examples of non-verbal, verbal and written communications.
0422.3.4 Use proper grammar and vocabulary in verbal and written communication.
0422.3.5 Prepare a portfolio of sample work to be utilized in an interview.
0422.3.6 Prepare for and practice an interview for a potential job.

Standard 4: Basic Marketing Math Skills (0422.S.4)
Perform Basic Marketing Math Skills that are utilized in the workplace.

Basic Marketing Math Skills Objectives
Students will:
0422.4.1 Perform procedures associated with the handling of cash, credit cards, and checks (e.g. making change, preparing and closing cash drawers, correcting register errors).
0422.4.2 Operate a calculator to calculate tax, discounts and net sales.
0422.4.3 Process exchanges, returns, allowances, layaways and other types of sales transactions.

Standard 5: Fundamentals of Marketing (0422.S.5)
Describe the Fundamentals of Marketing.

Marketing Fundamental Objectives
Students will:
0422.5.1 Define the role of marketing and its importance.
0422.5.2 Explain the functions of marketing.
0422.5.3 State the marketing concept.
0422.5.4 Describe the economic benefits of marketing.
0422.5.5 Identify the 4 P's of the marketing mix.
0422.5.6 Illustrate the use of product positioning.
0422.5.7 Analyze variables in the consumer and industrial market (demographics, geographics, psychographics) that determine the target market.
0422.5.8 Construct a customer profile.

Standard 6: Basic Safety Techniques (0422.S.6)
Apply and Demonstrate Basic Safety Techniques.

Basic Safety Techniques Objectives
Students will:
0422.6.1 Demonstrate basic safety rules relevant to job safety by reading the appropriate operating instructions and explain the role of OSHA.
0422.6.2 Describe the first aid measures to be used in case of an emergency on the job, along with the procedures to be followed in case of an accident.
0422.6.3 Classify type A, B, and C fires and describe characteristics in order to extinguish properly.
0422.6.4 Discuss appropriate practices for handling and storing hazardous materials.
0422.6.5 Explain the role of OSHA.

Standard 7: Principles of Selling (0422.S.7)
Apply the Principles of Selling.

Principles of Selling Objectives
Students will:
0422.7.1 Identify the steps in the selling process.
0422.7.2 Identify the different approaches in the sales process.
0422.7.3 Identify the different methods of closing a sale.
0422.7.4 Choose the proper method of determining needs and handling objections in closing a sale.
0422.7.5 Conduct a sales presentation.

Standard 8: Consumer Characteristics (0422.S.8)
Analyze Consumer Characteristics and Behaviors as They Relate to Marketing Goods and Services.

Consumer Characteristics Objectives
Students will:
0422.8.1 Categorize buying transactions according to buying motives.
0422.8.2 Discuss how customers make buying decisions.
0422.8.3 Analyze external influences on the consumer buying decision.

Standard 9: Economic Principles (0422.S.9)
Describe the Importance of Economic Principles in Today's Society.

Economic Principles Objectives
Students will:
0422.9.1 Identify the various measurements used to analyze the economy.

0422.9.2 Distinguish between economic wants and needs.
0422.9.3 Define economic goods and services.
0422.9.4 Identify the resources (factors of production) that are used to satisfy wants and needs.
0422.9.5 Explain how scarcity affects the availability of economic goods and services.
0422.9.6 Explain the benefits of competition.
0422.9.7 Identify the opportunity costs and trade-offs involved in making choices.
0422.9.8 Explain the effects of the business cycle on consumers, businesses and government.
0422.9.9 Explain what an economy is.
0422.9.10 Discuss advantages and disadvantages of different types of economic systems.
0422.9.11 Discuss how an economic system addresses the questions (what is to be produced, how it is to be produced, and for whom).
0422.9.12 Analyze the relationship of price to scarcity.
0422.9.13 Describe how prices affect buying and selling decisions.
0422.9.14 Graph the concept of price on a supply and demand curve.

Standard 10: Business Ethics and Social Responsibility (0422.S.10)
Discuss Business Ethics and Social Responsibility.

Business Ethics and Social Responsibility Objectives
Students will:
0422.10.1 Explain the basic functions of a business.
0422.10.2 Name the areas in which businesses are thought to have social responsibilities.
0422.10.3 List ways that business activities have impacted the environment.
0422.10.4 Suggest how marketers can make ethical choices.
0422.10.5 Define consumerism.
0422.10.6 Describe current trends that are likely to improve the workplace for employees.

Standard 11: The Global Marketplace (0422.S.11)
Discuss the Importance of International Trade to Nations.

Global Marketplace Objectives
Students will:
0422.11.1 Distinguish between imports and exports.
0422.11.2 Discuss the interdependence of nations.
0422.11.3 Explain the advantages and disadvantages of international trade.
0422.11.4 Discuss the U.S. balance of trade.
0422.11.5 Identify trade barriers, trade support and trade agreements.
0422.11.6 Analyze how cultural, economic and political factors impact businesses engaged in international trade.

Marketing Principles II

Prerequisite: MARKETING PRINCIPLES
This course includes instructional areas designed to prepare for a career in the field of marketing and management. Instruction will prepare students to perform one or more of the marketing functions such as selling, promoting, marketing research, and management. The course can utilize cooperative education to support classroom instruction.

Standard 1: Cooperative Education
Demonstrate Knowledge of Cooperative Education (co-op).

Cooperative Education Objectives
The student will:
0425.1.1 Explain co-op objectives and procedures.
0425.1.2 Analyze co-op rules and regulations.
0425.1.3 Participate in a co-op or project experience.

Standard 2: Principles of Promotion
Demonstrate the Principles of Promotion.

Principles of Promotion Objectives
The student will:

0425.2.1 Define promotion and its role in the economy.
0425.2.2 Explain the role of an advertising agency.
0425.2.3 Describe the nature and scope of public relations and publicity.
0425.2.4 Apply the promotional mix to products and services.
0425.2.5 Determine the target market.
0425.2.6 Identify the types of advertising media and discuss the advantages and disadvantages of each type.
0425.2.7 Develop a print advertisement using effective headlines, copy, illustrations, layouts, color and type face for a product or service.
0425.2.8 Calculate cost per thousand advertising costs to determine cost effectiveness.
0425.2.9 Create visual merchandising displays using various types of display arrangements, color schemes, display backgrounds, mannequins and lighting.
0425.2.10 Prepare a broadcast advertisement.
0425.2.11 Calculate media cost.
0425.2.12 Compare and contrast the elements of visual merchandising.

Standard 3: Fundamentals of Distribution
Define the Fundamentals of Distribution.

Fundamentals of Distribution Objectives
The student will
0425.3.1 Demonstrate the flow of products in the channel of distribution.
0425.3.2 Choose the most cost-effective distribution channel for products.
0425.3.3 Calculate shipping costs using shipping terms.
0425.3.4 Describe three levels of distribution intensity.
0425.3.5 Identify transportation systems for the distribution of products.
0425.3.6 Identify various types of warehouses.

Standard 4: Analyze Pricing
Analyze Pricing Procedures.

Analyze Pricing Objectives
The student will
0425.4.1 Identify various pricing techniques.
0425.4.2 Identify the factors affecting selling price.
0425.4.3 Distinguish between market share and market position.
0425.4.4 Analyze the psychological effects of pricing in the consumer's buying behavior.
0425.4.5 Perform pricing calculations.
0425.4.6 Calculate break-even point, mark-up and markdown.
0425.4.7 Determine the selling price of a product or service.

Standard 5: Reducing Marketing Risk
Identify Techniques to Reduce Marketing Risk.

Reducing Marketing Risk Objectives
The student will
0425.5.1 Describe the types of risk that businesses encounter.
0425.5.2 Determine methods to prevent, reduce, control or transfer risks.
0425.5.3 Outline effective routine security precautions for a business.
0425.5.4 Identify methods of internal theft and shoplifting.

Standard 6: Business Purchasing Procedures
Identify Purchasing Procedures Used by a Business.

Business Purchasing Procedures Objectives
The student will
0425.6.1 Define purchasing and the procedures used in buying/purchasing.
0425.6.2 Explain the buying process.
0425.6.3 Select appropriate products to sell.
0425.6.4 Choose a vendor for a product.
0425.6.5 Decide proper inventory levels for products.
0425.6.6 Compare and contrast inventory control systems.
0425.6.7 Calculate merchandising related discounts and extensions.
0425.6.8 Describe how merchandise is received, checked and marked.
0425.6.9 Prepare purchase orders and invoices.

Standard 7: Finance Principles
Identify the Principles of Finance.

Principles of Finance Objectives
The student will
0425.7.1 Explain the functions of financing.
0425.7.2 Explain the purposes, types and importance of credit.
0425.7.3 Calculate interest cost.
0425.7.4 Summarize credit legislation.

Standard 8: Product/Service Planning
Identify the Aspects of Product/Servicing Planning

Product/Service Planning Objectives

0425.8.1 Explain the nature and scope of product planning.
0425.8.2 Analyze the steps in the consumer buying process.
0425.8.3 Research the impact of consumer protection provisions on the consumer's buying behavior using primary and secondary data.
0425.8.4 Describe extended product features such as warranties and contracts.
0425.8.5 List the principle functions of product packaging and labeling.
0425.8.6 Explain the nature and scope of branding.
0425.8.7 Define the product life cycle.
0425.8.8 Summarize the major provisions of product legislation.

Standard 9: Marketing Research
Define the Nature and Scope of Marketing Research.

Marketing Research Objectives
The student will
0425.9.1 Discuss the importance of marketing research in planning and implementing marketing strategies.
0425.9.2 Explain the function of a marketing information system.
0425.9.3 Describe the four important areas of marketing research.
0425.9.4 Describe the five steps in conducting marketing research.
0425.9.5 Write research instruments.
0425.9.6 Conduct marketing research to identify the market for a product or service.

Standard 10: Management Skills
Explain the Functions of Management.

Management Skills Objectives
The student will
0425.10.1 Describe how management teams are organized.
0425.10.2 Explain the functions of management.
0425.10.3 Analyze the advantages and disadvantages of a career in management.
0425.10.4 Identify management techniques.

Standard 11: Entrepreneurship
Examine Entrepreneurship Opportunities.

Entrepreneurship Objectives
The student will
0425.11.1 Define entrepreneurship.
0425.11.2 Identify the risks involved in entrepreneurship.
0425.11.3 Discuss the advantages and disadvantages of entrepreneurship.
0425.11.4 Identify the personal characteristics and skills entrepreneurs need.
0425.11.5 Discuss business ownership opportunities.

Marketing Work Experience/Internship

Marketing Work Experience/Internship is a method of instruction for students to receive on-the-job training that contributes to the over-all instructional program. The instruction, through written agreement between school and employers, is a combination of study in school with employment in the appropriate field. The related classroom instruction and on-the-job experiences are planned and supervised by employers and teacher coordinators to complete the student's education as to his/her career objective.

Standard 1: Human Relations Skills (0428.S.1)
Demonstrate Human Relations Skills.

Human Relations Skills Objectives
Students will:
0428.1.1 Demonstrate honesty and integrity.
0428.1.2 Use proper business ethics in all business activities.
0428.1.3 Demonstrate respect for customers, co-workers and management.
0428.1.4 Demonstrate initiative in completing job duties.
0428.1.5 Maintain a positive attitude and positive relationship with customers, co-workers and management.
0428.1.6 Adapt to changes in job responsibilities.
0428.1.7 Appreciate diversity in the workplace.
0428.1.8 Exhibit self-control when working with customers, co-workers and management.
0428.1.9 Use appropriate assertiveness.
0428.1.10 Exhibit empathy for customers, co-workers and management.
0428.1.11 Use feedback from others for personal growth.
0428.1.12 Practice proper business etiquette.
0428.1.13 Identify procedures to respond to sexual harassment.

Standard 2: Business Communications (0428.S.2)
Demonstrate Appropriate Business Communication Skills.

Communications Objectives
Students will:
0428.2.1 Use correct grammar and vocabulary in written and oral communications.
0428.2.2 Listen to and follow directions.
0428.2.3 Explain policies and procedures to customers and clients.
0428.2.4 Perform proper telephone techniques appropriately.
0428.2.5 Demonstrate the proper procedure for job termination.

Standard 3: Basic Work Skills (0428.S.3)
Demonstrate Mastery of Basic Work Skills for a Chosen Occupation.

Basic Work Skills Objectives
Students will:
0428.3.1 Maintain punctuality, appropriate attendance and dependability.
0428.3.2 Work independently without direct supervision.
0428.3.3 Stay with an assigned task until successful completion.
0428.3.4 Utilize time management principles when completing assignments.
0428.3.5 Apply organizational skills in daily activities.
0428.3.6 Participate as a team member when completing a work project.
0428.3.7 Produce quality work.

0428.3.8 Accept accountability for one's performance.
0428.3.9 Perform basic mathematical functions.
0428.3.10 Operate the most common electronic equipment with speed and accuracy.
0428.3.11 Maintain appropriate records for use on the job and in class.
0428.3.12 Demonstrate leadership skills when completing a project or task.
0428.3.13 Exhibit decision-making skills.
0428.3.14 Solve problems individually and as a team member.
0428.3.15 Participate in company meetings and activities.

Standard 4: Basic Safety Techniques (0428.S.4)
Apply and Demonstrate Basic Safety Techniques.

Basic Safety Techniques Objectives
Students will:
0428.4.1 Practice basic safety rules.
0428.4.2 Handle company equipment properly and safely.
0428.4.3 Demonstrate safety procedures for handling and lifting heavy materials.
0428.4.4 Follow procedures in the case of an accident, including reporting procedures.
0428.4.5 Follow security procedures.
0428.4.6 Practice proper safety procedures for handling and storing hazardous materials.
0428.4.7 Recognize and report hazardous conditions.
0428.4.8 Read and interpret operating instructions before using equipment.
0428.4.9 Explain and practice procedures for safe evacuation.
0428.4.10 Classify type A, B, and C fires and describe characteristics in order to extinguish properly.
0428.4.11 Identify proper agencies for safety procedures (fire department, police department, OSHA, hospital).

Professional Selling/Salesmanship

This course focuses on the purpose of the promotional strategy of selling and its role in the marketing environment. Emphasis is placed on the purpose and steps of the sales process, and the importance of completing each step in the presentation. Professional Selling as a career is also explored.

Standard 1: Fundamentals of Marketing (0431.S.1)
Describe the Fundamentals of Marketing.

Fundamentals of Marketing Objectives
The student will:

0431.1.1 Define the role of marketing and its importance.
0431.1.2 Explain the functions of marketing.
0431.1.3 State the marketing concept.
0431.1.4 Describe the economic benefits of marketing.
0431.1.5 Identify the 4 P's of the marketing mix.
0431.1.6 Illustrate the use of product positioning.
0431.1.7 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0431.1.8 Construct a customer profile.

Standard 2: Promotion (0431.S.2)
Define Promotion.

Promotion Objectives
The student will:

0431.2.1 Explain the role of promotion.
0431.2.2 Explain the concept of the promotional mix.
0431.2.3 Develop a promotional plan.
0431.2.4 Evaluate ethical standards of various promotional media.
0431.2.5 Distinguish between personal selling, advertising, publicity, sales promotion and visual merchandising.

Standard 3: Selling as a Promotional Tool (0431.S.3)
Explore Selling as a Promotional Tool.

Selling As a Promotional Tool Objectives
The student will:

0431.3.1 Identify the characteristics and benefits of selling.
0431.3.2 Explore sales as a career.
0431.3.3 Distinguish between the different types of sales positions.
0431.3.4 Identify the characteristics of a successful salesperson.
0431.3.5 Differentiate between consumer and industrial sales.
0431.3.6 Identify the steps in the sales process.
0431.3.7 Recognize cultural differences that are encountered in sales.
0431.3.8 Write a sales manual.
0431.3.9 Conduct a sales presentation.

Standard 4: Know Your Customer (0431.S.4)
Analyze the Importance of Knowing Your Customer.

Know Your Customer Objectives
The student will:
0431.4.1 Distinguish between rational and emotional buying motives.
0431.4.2 Explain the customer decision-making process.
0431.4.3 Differentiate between a consumer and a customer.
0431.4.4 Identify various customer personality types.

Standard 5: Product Knowledge (0431.S.5)
Analyze the Importance of Product Knowledge.

Product Knowledge Objectives
The student will:
0431.5.1 Identify features and benefits of a product or service.
0431.5.2 Demonstrate product/company knowledge needed for effecting selling.
0431.5.3 Research sources of product knowledge.

Standard 6: Preapproach Activities (0431.S.6)
Identify Preapproach Activities.

Preapproach Activities Objectives
The student will:
0431.6.1 Prepare a prospect list.
0431.6.2 Quality the customer for the list.
0431.6.3 Identify stock keeping and house keeping activities.
0431.6.4 Review sales records concerning the customer.
0431.6.5 Prepare sales materials.

Standard 7: Approach Activities (0431.S.7)
Identify Approach Activities.

Approach Activities Objectives
The student will:
0431.7.1 Discuss the purpose and importance of the approach.
0431.7.2 Identify types of retail approaches.
0431.7.3 Identify activities in the industrial approach.

Standard 8: Determine Customer Needs (0431.S.8)
Explain Why Determining Customer Needs is Essential in the Sales Process.

Determine Customer Needs Objectives
The student will:
0431.8.1 Describe methods used for determining customer needs.
0431.8.2 Discuss various questioning techniques.
0431.8.3 Consider the importance of nonverbal communication.
0431.8.4 Explain the necessity of effective listening.

Standard 9: Demonstration/Presentation (0431.S.9)
Identify Characteristics of a Demonstration/Presentation.

Demonstration/Presentation Objectives
The student will:

0431.9.1 Demonstrate how selling points are used in the demonstration/presentation.
0431.9.2 Explain how products are selected for the demonstration/presentation.
0431.9.3 Identify products to present to customer.
0431.9.4 Display the product for customer consideration.
0431.9.5 Involve the customer in the demonstration/presentation.
0431.9.6 Prepare sales aids.
0431.9.7 Utilize proper vocabulary to demonstrate product.
0431.9.8 Evaluate customer feedback.

Standard10: Handling Customer Objections and Questions (0431.S.10)
Identify Methods to Handle Objections and Questions.

Objections and Questions Objectives
The student will:
0431.10.1 Explain the difference between an excuse and an objection.
0431.10.2 Prepare an objection and analysis sheet.
0431.10.3 Identify common sources of objections.
0431.10.4 Explain the process of handling objections.
0431.10.5 Identify specialized methods of handling objections.
0431.10.6 Give examples of open ended and closed ended questions.

Standard11: Closing the Sale (0431.S.11)
Identify Techniques for Closing a Sale.

Closing the Sale Objectives
The student will:
0431.11.1 List buying signals that a customer sends.
0431.11.2 Explain the general rules for closing a sale.
0431.11.3 Describe specialized methods of closing the sale.
0431.11.4 Recognize the importance of closing the sale.
0431.11.5 Evaluate the reasons for failing to close a sale.
0431.11.6 Demonstrate methods of closing a sale.

Standard12: Suggestion Selling (0431.S.12)
Identify the Importance of Suggestion Selling.

Suggestion Selling Objectives
The student will:
0431.12.1 Identify the benefits of suggestion selling.
0431.12.2 Explain the rules of suggestion selling.
0431.12.3 Demonstrate methods of suggestion selling.

Standard13: Follow-Up Activities (0431.S.13)
Identify Follow-Up Activities.

Follow-Up Activities Objectives
The student will:
0431.13.1 Define the importance of relationship marketing.
0431.13.2 Summarize the importance of after-sale activities.
0431.13.3 Send thank you letters.
0431.13.4 Process payments.
0431.13.5 Identify sources of customer support.

Standard14: Selling Math Activities (0431.S.14)
Perform Selling Math Activities.

Selling Math Activities Objectives
The student will:

0431.14.1 Perform procedures associated with the handling of cash, credit cards, and checks (e.g. making change, preparing and closing cash drawers, correcting register errors).
0431.14.2 Describe the arrangement of currency and coins in a cash register.
0431.14.3 State the rules for safeguarding money in the cash register.
0431.14.4 Operate a calculator to calculate tax, discounts and net sales.
0431.14.5 Process exchanges, returns, allowances, layaways and other types of sales transactions.
0431.14.6 Prepare a purchase order and invoice.
0431.14.7 Calculate shipping costs.
0431.14.8 Identify methods of fraud protection.

Standard15: Sales Management (0431.S.15)
Identify Sales Management Activities.

Sales Management Activities Objectives
The student will:

0431.15.1 Track sales figures.
0431.15.2 Prepare a sales report.
0431.15.3 Identify techniques for motivating employees.
0431.15.4 Prepare sales goals.

Sports, Entertainment, Recreation In Marketing

This course includes instructional areas designed to prepare for a career in the field of sports, entertainment and/or recreational marketing. The function of Sports Marketing is to determine the interests of the consumer and plan a product or service that the spectator will buy.

Standard 1: Marketing Sports, Entertainment and Recreational Events (0434.SD.1)
Explain the Importance of Sports, Entertainment, and Recreation Marketing.

Importance of Marketing Sports, Entertainment and Recreational Events Objectives
The student will:
0434.1.1 Identify the place of sports, entertainment and recreation (SER) in the field of marketing.
0434.1.2 Identify SER careers.
0434.1.3 Analyze the growth and trends of SER as an industry in the local, state, national and international arenas.

Standard 2: Marketing and Business Overview (0434.SD.2)
Investigate an Overview of Marketing and Business.

Marketing and Business Objectives
The student will:
0434.2.1 Define the marketing functions.
0434.2.2 Identify the components of the marketing mix.
0434.2.3 State the marketing concept.
0434.2.4 Identify the use of market positioning.
0434.2.5 Explain the need and describe the methods of market research.
0434.2.6 Identify types of segmentation and determine the target market.
0434.2.7 Describe the four stages in the product life cycle.

Standard 3: Business Structure (0434.SD.3)
Explain the Business Structure of Sports, Entertainment, and Recreation.

Business Structure Objectives
The student will:
0434.3.1 Identify examples of business ownership.
0434.3.2 Explain reasons for operating as a profit or not-for-profit organization.
0434.3.3 Describe the partnership of business and government to develop SER opportunities.

Standard 4: Communication Strategies (0434.SD.4)
Develop Effective Communication Strategies.

Communication Strategies Objectives
The student will:
0434.4.1 Explain the components of the communication process.
0434.4.2 Identify listening strategies and barriers to effective communication.
0434.4.3 Compose written business communications.
0434.4.4 Interpret nonverbal communication.

Standard 5: Promotion (0434.SD.5)
Develop Promotion.

Promotion Objectives
The student will:

0434.5.1 Describe the five elements of the promotional mix.
0434.5.2 Differentiate between product and institutional promotions.
0434.5.3 Develop a logo, trademark, slogan and trade character.
0434.5.4 Describe the importance of selling.
0434.5.5 Identify the steps of a sale.
0434.5.6 Describe the four major types and uses of sales promotion.
0434.5.7 Develop a promotion campaign.
0434.5.8 Identify the responsibilities of a Sports Information Director or Public Relations person.
0434.5.9 Explain the composition of the media and effective ways to work with each.
0434.5.10 Develop a media/press release, letterhead, mailing list and PSA.
0434.5.11 Explain the types of advertising media.
0434.5.12 Describe the elements of an advertisement.

Standard 6: Sponsorship (0434.SD.6)
Analyze the Purpose of Sponsorship.

Sponsorship Objectives
The student will:
0434.6.1 Explain the reasons for a company to use sponsorship.
0434.6.2 Explain the sociological rationales for buying into sports and entertainment.
0434.6.3 Identify reasons for athlete/entertainer endorsements.
0434.6.4 Evaluate a sponsorship marketing plan/proposal and discuss legal issues.
0434.6.5 Analyze the pricing of sponsorships.

Standard 7: Legal Considerations (0434.SD.7)
Investigate Legal Considerations.

Legal Considerations Objectives
The student will:
0434.7.1 Explain expressed, implied, unilateral and bilateral contracts.
0434.7.2 Identify essential elements of contracts and the legal implications.
0434.7.3 Explain the role of licensing.

Standard 8: Agents and Personal Managers (0434.SD.8)
Examine the Role of Agents and Personal Managers.

Agents and Personal Managers Objectives
The student will:
0434.8.1 Identify the role of agents and personal managers.
0434.8.2 Explain the types of agreements/contracts and financial compensation.
0434.8.3 Identify the factors involved in selection of an agent/personal manager.
0434.8.4 Identify the agent's role in pre-negotiations and endorsement contracts.

Standard 9: Labor Unions (0434.SD.9)
Appraise the Role of Labor Unions.

Labor Union Objectives
The student will:
0434.9.1 Examine the role of unions in sports, entertainment, and recreation marketing.
0434.9.2 Explain the use of collective bargaining in union negotiations.

Standard 10: Business Ethics (0434.SD.10)
Explore Business Ethics.

Business Ethic Objectives
The student will:
0434.10.1 Explain management's role in ethical practices.
0434.10.2 Describe ways to improve ethical behavior in business.
0434.10.3 Explain bootlegging and the ways companies are affected.

Standard 11: Risk Management (0434.SD.11)
Explain the Importance of Risk Management.

Risk Management Objectives
The student will:
0434.11.1 Identify risks.
0434.11.2 Analyze the importance of security and insurance.
0434.11.3 Determine methods to prevent, reduce, control or transfer risks.

Standard 12: Event Planning (0434.SD.12)
Develop and Plan an Event.

Event Planning Objectives
The student will:
0434.12.1 Analyze the growth and trends of event planning.
0434.12.2 Explore sports or entertainment events.
0434.12.3 Illustrate job duties in event planning.
0434.12.4 Develop an event plan.
0434.12.5 Evaluate the event plan.

Standard 13: Financial Planning (0434.SD.13)
Determine the Importance of Financial Planning.

Financial Planning Objectives
The student will:
0434.13.1 Identify sources of costs for SER businesses.
0434.13.2 Explain net profit/net loss and how it is calculated.
0434.13.3 Identify the components of a budget.
0434.13.4 Identify revenue sources.

Standard 14: Product Development (0434.SD.14)
Analyze Product Development.

Product Development Objectives
The student will:
0434.14.1 Describe types of concessions.
0434.14.2 Identify factors affecting product development and concessions.
0434.14.3 Define internal/external merchandise opportunities.

Tour/Hospitality Marketing

This course focuses on the importance of marketing in the tourism and hospitality industry. Careers in the tourism and hospitality are also explored.

Standard 1: Fundamentals of Marketing (0437.S.1)
Describe the fundamentals of marketing.

Fundamentals of Marketing Objectives
The student will:

0437.1.1 Describe the environment for marketing in the hospitality and travel industry.
0437.1.2 Define the role of marketing and its importance.
0437.1.3 Explain the functions of marketing.
0437.1.4 State the marketing concept.
0437.1.5 Describe the economic benefits of marketing.
0437.1.6 Identify the 4 P's of the marketing mix.
0437.1.7 Illustrate the use of product positioning.
0437.1.8 Analyze variables in both the consumer and industrial markets (demographics, geographics, psychographics) that determine the target market.
0437.1.9 Construct a customer profile.

Standard 2: Marketing and Travel (0437.S.2)
Identify the importance of marketing in the travel industry.

Marketing and Travel Objectives
The student will:

0437.2.1 Explain the meaning of services marketing.
0437.2.2 Differentiate between the marketing of services and the marketing of products.
0437.2.3 Discuss the fundamentals of the hospitality and travel marketing system.
0437.2.4 List the benefits of using the hospitality and travel marketing system.
0437.2.5 Define long- and short-term marketing planning.
0437.2.6 Distinguish between a strategic market plan and a marketing plan.

Standard 3: Marketing Opportunities in Tourism and Hospitality (0437.S.3)
Analyze marketing opportunities.

Marketing Opportunities Objectives
The student will:

0437.3.1 Differentiate between situation, market and feasibility analyses.
0437.3.2 Describe the steps in a situation analysis.
0437.3.3 Describe the steps in a market analysis.
0437.3.4 Describe the steps in a feasibility analysis.

Standard 4: Marketing Research (0437.S.4)
Analyze the importance of marketing research.

Marketing Research Objectives
The student will:

0437.4.1 Discuss the importance of marketing research in planning and implementing marketing strategies.
0437.4.2 Explain the function of a marketing information system.
0437.4.3 Describe the four important areas of marketing research.

0437.4.4 Describe the five steps in conducting marketing research.
0437.4.5 Write research instruments.
0437.4.6 Conduct marketing research to identify the market.
0437.4.7 Discuss the criteria used to determine the viability of market segments.
0437.4.8 List the bases that can be used to segment hospitality and travel markets.
0437.4.9 Describe the major demand and supply trends that influence the industry.
0437.4.10 Describe how the effectiveness of various marketing strategies varies with the product life cycle and an organization's position in the industry.
0437.4.11 Identify the factors that have made positioning essential in the industry.
0437.4.12 Describe the approaches to positioning.

Standard 5: Customer Behavior (0437.S.5)
Discuss customer behavior.

Customer Behavior Objectives
The student will:
0437.5.1 Describe personal factors that influence customer behavior.
0437.5.2 Explain the factors that influences customers' perception of the industry.
0437.5.3 Describe interpersonal factors that influence customer behavior.
0437.5.4 List the steps in the customer buying process.

Standard 6: Marketing Plan (0437.S.6)
Write a marketing plan.

Marketing Plan Objectives
The student will:
0437.6.1 Identify the characteristics of a marketing plan.
0437.6.2 List requirements for an effective marketing plan.
0437.6.3 Explain the benefits of having a marketing plan.
0437.6.4 Complete a demographic study to determine a market.
0437.6.5 Determine market potential.
0437.6.6 Identify direct and indirect competition.
0437.6.7 Evaluate competitive strengths and weaknesses.
0437.6.8 State the marketing concept.
0437.6.9 Utilize market segmentation and target marketing.
0437.6.10 Identify and apply the components of the marketing mix.
0437.6.11 Explain approaches to develop a marketing budget.

Standard 7: Product Development (0437.S.7)
Analyze the importance of product development.

Product Development Objectives
The student will:
0437.7.1 Identify the components of an organization's product/service mix.
0437.7.2 Explain the steps in product development.
0437.7.3 Explain the potential benefits of marketing partnerships to hospitality and travel organizations.

Standard 8: People and Service Quality (0437.S.8)
Explain why people and service quality are important to the industry.

People and Service Quality Objectives
The student will:
0437.8.1 Explain the key role played by people in the marketing mix.
0437.8.2 Describe the total quality management (TQM) concept.
0437.8.3 Explain the importance of employee selection, orientation, training and motivating programs.
0437.8.4 Describe the concept of empowering employees.
0437.8.5 Describe the customer mix.

Standard 9: Distribution (0437.S.9)
Explain distribution in the industry.

Distribution Objectives
The student will:
0437.9.1 Differentiate between the distribution mix in the hospitality and travel industry and other industries.
0437.9.2 List the major travel trade intermediaries.
0437.9.3 Explain the roles played by each of the major travel trade intermediaries.

Standard10: Communication and the Promotional Mix (0437.S.10)
Identify the connection between communication and the promotional mix.

Communication and the Promotional Mix Objectives
The student will:
0437.10.1 List the elements of the promotional mix.
0437.10.2 Explain the communication process.
0437.10.3 Describe how the customer's buying process stage and the buying decision classification influence the effectiveness of promotions.
0437.10.4 Discuss the goals of promotion.
0437.10.5 Explain the relationship of the promotional mix and the marketing mix.

Standard11: Advertising (0437.S.11)
Identify the importance of advertising in the industry.

Advertising Objectives
The student will:
0437.11.1 Identify the various types of media.
0437.11.2 Analyze the advantages and disadvantages of each type of media.
0437.11.3 Select the appropriate media for the target market.
0437.11.4 Identify standards for selecting advertising media.
0437.11.5 Evaluate the effectiveness of the advertising media.
0437.11.6 Explain the difference between consumer and trade advertising.
0437.11.7 Explain how the hospitality and travel industry tends to use advertising.
0437.11.8 Describe the role of advertising agencies.

Standard12: Sales Promotion (0437.S.12)
Identify the importance of sales promotion in the industry.

Sales Promotion Objectives
The student will:
0437.12.1 Identify the characteristics and benefits of sales promotion.
0437.12.2 Differentiate between the various types of sales promotion.

0437.12.3 Analyze the advantages and disadvantages of the various types of sales promotion.
0437.12.4 Select appropriate sales promotion.
0437.12.5 Explain the difference between special communication and special offer promotions.
0437.12.6 Develop a sales promotion.
0437.12.7 Evaluate the effectiveness of a sales promotion.

Standard13: Personal Selling (0437.S.13)
Identify the importance of personal selling in the industry.

Personal Selling Objectives
The student will:
0437.13.1 Identify the characteristics and benefits of selling.
0437.13.2 Differentiate between consumer and industrial sales.
0437.13.3 Describe the characteristics of the successful salesperson.
0437.13.4 Identify the steps in the sales process.
0437.13.5 Recognize cultural differences that are encountered in sales.
0437.13.6 Conduct a sales presentation.

Standard14: Public Relations (0437.S.14)
Identify the importance of public relations in the industry.

Public Relations Objectives
The student will:
0437.14.1 Identify the characteristics and benefits of public relations and publicity.
0437.14.2 Identify the audiences for public relations.
0437.14.3 Describe the steps in developing a public relations plan.
0437.14.4 Identify the vehicles used for public relations and publicity.
0437.14.5 Explain the role and advantages of public relations consultants.
0437.14.6 Write a media release.

Early Childhood & Educational Services I

Early Childhood and Educational Services provides the integrated knowledge, skill, and practices required for careers in early childhood education and services.

Standard 1: Developmental Practices (1001.S.1)
The student will analyze developmentally appropriate practices to plan for early childhood education and services.

Developmental Practices Objectives
The students will:
1001.1.1 Examine child development theories and their applications for educational and childcare practices as they relate to physical, social, emotional, and cognitive development of children.*
1001.1.2 Determine a variety of assessment methods to observe and interpret children's growth and development.*
1001.1.3 Consider cultural and environmental influences when assessing children's development.*
1001.1.4 Determine special needs of children.
1001.1.5 Put into effect strategies that promote children's growth and development.*

Standard 2: Developmental Needs and Interests (1001.S.2)
The student will demonstrate integration of curriculum and instruction to meet children's developmental needs and interests.

Developmental Needs and Interests Objectives
The students will:
1001.2.1 Examine a variety of curriculum and instructional models.*
1001.2.2 Implement learning activities in all curriculum areas that meet the developmental needs of children.*
1001.2.3 Implement an integrated curriculum that incorporates a child's language, learning styles, home experiences, and cultural values.*
1001.2.4 Demonstrate a variety of teaching methods to meet individual needs of children.*
1001.2.5 Arrange learning centers that provide for children's exploration, discovery, and development.
1001.2.6 Establish activities, routines, and transitions.

Standard 3: Learning Environment (1001.S.3)
The student will demonstrate a safe and healthy learning environment for children.

Learning Environment Objectives
The student will:
1001.3.1 Manage physical space to maintain a safe and healthy learning environment.*
1001.3.2 Apply safe and healthy practices that comply with state regulations.*
1001.3.3 Implement strategies to teach children health, safety, and sanitation habits.*
1001.3.4 Provide safe and healthy meals and snacks.*
1001.3.5 Document symptoms of child abuse and neglect and use appropriate procedures to report suspected abuse or neglect to the designated authorities.
1001.3.6 Implement basic health practices and prevention procedures for workers and children regarding childhood illness and communicable diseases.*
1001.3.7 Demonstrate security and emergency procedures.

**Instructional goals and objectives have been correlated with the United States Department of Labor Child Development Specialist curriculum.*
** Child Development Specialist 1*

Early Childhood And Educational Services II

Early Childhood and Educational Services provides the integrated knowledge, skills, and practices required for careers in early childhood education and services.

Standard 1: Career Paths (1002.S.1)
The student will analyze career paths within early childhood education and services

Career Paths Objectives
The student will:
1002.1.1 Determine the roles and functions of individuals engaged in early childhood education and services.*
1002.1.2 Explore opportunities for employment and entrepreneurial endeavors.
1002.1.3 Examine education and training requirements and opportunities for career paths in early childhood education and services.
1002.1.4 Examine the impact of early childhood education and services occupations on local, state, national, and global economies.

Standard 2: Relationships (1002.S.2)
The student will demonstrate techniques for positive collaborative relationships with children.

Relationships Objectives
The student will:
1002.2.1 Establish developmentally appropriate guidelines for behavior.
1002.2.2 Demonstrate problem-solving skills with children.*
1002.2.3 Demonstrate interpersonal skills that promote positive and productive relationships with children.*
1002.2.4 Implement strategies for constructive and supportive interactions between children and families.
1002.2.5 Present information to parents regarding developmental issues and concerns related to children.

Standard 3: Practices and Standards (1002.S.3)
The student will demonstrate professional practices and standards related to working with children.

Practices and Standards Objectives
The student will:
1002.3.1 Utilize opportunities for continuing training and education.
1002.3.2 Apply professional ethical standards as accepted by the recognized professional organizations.
1002.3.3 Implement federal, state, and local standards, policies, regulations, and laws which impact children, families, and programs.
1002.3.4 Demonstrate enthusiasm, initiative, and commitment to program goals and improvements.
1002.3.5 Apply business management skills to planning businesses in early childhood education and services.

**Instructional goals and objectives have been correlated with the United States Department of Labor Child Development Specialist curriculum.*

** Child Development Specialist 1*

ProStart I (1011 or 1951)

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete 400 hour off-campus, paid internship. This first course focuses on the basics of preparing and service safe food, preventing accidents, using foodservice equipment and preparing certain types of foods. It also addresses the business topics of human relations, customer service, controlling costs and certain math concepts.

Standard 1: Prepare for a successful career in foodservice management. (1011.S.1)

Foodservice Management Objectives
Students will:

1011.1.1 Recognize how the foodservice industry provides a unique workplace environment.
1011.1.2 Describe the importance of service to success in foodservice
1011.1.3 Describe the elements of excellent service.
1011.1.4 Identify ways to speak to customers and coworkers.
1011.1.5 Identify career opportunities within the foodservice industry.
1011.1.6 Describe the steps in looking for a job.
1011.1.7 Complete the necessary documents for a job interview including the resume, cover letter, and application.
1011.1.8 Participate in a job interview.

Standard 2: Prepare and serve safe food. (1011.S.2)

Safe Food Objectives
Students will:

1011.2.1 Demonstrate proper sanitary procedures for use in food service.
1011.2.2 Show how contamination and cross-contamination is most likely to occur.
1011.2.3 List the major causes of foodborne illnesses, and describe potentially hazardous foods.
1011.2.4 Describe the micro-organisms that cause foodborne illnesses and the conditions in which they thrive.
1011.2.5 Demonstrate safe and proper procedures for receiving, storing, preparing, holding, and serving food.
1011.2.6 Describe ways to prevent infestation by pests.

Standard 3: Practice safe workplace habits. (1011.S.3)

Safe Workplace Objectives
Students will:

1011.3.1 Demonstrate proper safety procedures commonly used in foodservice operations.
1011.3.2 Describe the role of OSHA regulations and explain the Hazard Communication Standard requirements for employers.
1011.3.3 Demonstrate proper procedures for reducing accidents involving fire, slips, trips, falls, lifting and carrying, cuts and equipment.

Standard 4: Demonstrate the basics food preparation. (1011.S.4)

Food Preparation Objectives

Students will:

1011.4.1 Describe the various liquid and dry cooking methods and the foods to which they are best suited.

1011.4.2 Read and follow standardized recipes, describing their components and functions, and convert them to smaller and larger quantities.

1011.4.3 Explain the functions of different types of knives and demonstrate their proper use.

1011.4.4 Identify the tools commonly used in food service for wet and dry measure and demonstrate understanding of equivalence of standard American and metric measures.

1011.4.5 Define common cooking and foodservice terms.

Standard 5 :Operate foodservice equipment safely and effectively. (1011.S.5)

Foodservice Equipment Objectives

Students will:

1011.5.1 List and describe the equipment commonly used in the receiving, storage, food preparation, baking, holding and service, bar, dishwashing and waste disposal areas.

1011.5.2 List and describe the measuring utensils, hand tools, knives, pots and pans commonly used in a food service operation.

1011.5.3 Discuss how to troubleshoot the maintenance and repair of mixers, slicers, steamers, broilers, ranges, grills, fryers, ovens, food warmers, coffee urns, dishwashers and waste disposal systems.

1011.5.4 Discuss the role of the health inspector and how managers get ready for inspections.

Standard 6: Discuss the role of nutrition in a food service operations. (1011.S.6)

Nutrition in Food Service Operations Objectives

Students will:

1011.6.1 Explain the role of Recommended Dietary Allowances (RDAs) and the Food Guide Pyramid in planning healthful meals.

1011.6.2 Plan interesting, appealing and nutritionally balanced meals.

1011.6.3 Demonstrate cooking methods and identify recipes that preserve nutrients in quantity cooking.

Standard 7: Prepare sandwiches and breakfast foods. (1011.S.7)

Sandwiches and Breakfast Foods Objectives

Students will:

1011.7.1 Explain the roles of the production sheet, daily food cost sheet, sales history, and sales mix record in quantity food production.

1011.7.2 Perform total food cost and food cost percentage calculations.

1011.7.3 Determine the total cost and portion cost of standardized recipes.

1011.7.4 Explain the roles of the three components of a sandwich: bread, spread and filling.

1011.7.5 Compare and contrast the various types of sandwich: simple hot, open-faced, deep-fried, simple cold, tea and canapé.

1011.7.6 Set up a safe, sanitary, and efficient sandwich station.

1011.7.7 List the various forms in which milk is available and define pasteurize and homogenize.

1011.7.8 Compare and contrast current, aged, and processed cheeses and give examples of each.

1011.7.9 Describe the methods for cooking eggs: boiled, baked, shirred, poached, fried, scrambled, deviled, omelet, quiche, and soufflé.

1011.7.10 Prepare common breakfast food: pancakes and similar foods, eggs, breakfast cereals and breakfast meats.

Standard 8: Prepare salads and garnishes. (1011.S.8)

Salads and Garnishes Objectives
Students will:
1011.8.1 Discuss characteristic of the various ingredients that can be used to make both common and unusual salads.
1011.8.2 Prepare and store salads properly.
1011.8.3 Demonstrate techniques used to prepare garnishes
1011.8.4 Discuss common salad dressings and condiments.

Standard 9: Understand personnel management techniques. (1011.S.9)

Personnel Management Techniques Objectives
Students will:
1011.9.1 Demonstrate quality customer service techniques.
1011.9.2 Describe the elements involved in staff planning, recruiting, interviewing, and selecting employees
1011.9.3 Discuss effective methods of motivating and retaining employees
1011.9.4 Show techniques used to conduct and effective employee evaluation.

Standard 10: Prepare fruits and vegetables. (1011.S.10)

Fruits and Vegetables Objectives
Students will:
1011.10.1 Describe and identify the various varieties of fruits and vegetables and the forms in which they are available (fresh, frozen etc.).
1011.10.2 List seasons in which fresh fruits and vegetables are at their best quality and lowest price.
1011.10.3 Match different cooking methods to various fruits and vegetables.
1011.10.4 Explain how to properly select and purchase, receive, store, and handle fruits and vegetables.
1011.10.5 Prepare fruits and vegetables in a variety of ways.

Standard 11: Control food service costs. (1011.S.11)

Food Service Costs Objectives
Students will:
1011.11.1 Perform basic math operations as they relate to foodservice operations: i.e., determine percentages, convert recipes, convert form American and metric units of measure, approximate recipe yields.
1011.11.2 Describe different types of costs related to food, beverage and labor: controlled costs, fixed costs, variable costs, etc.
1011.11.3 Demonstrate operational procedures for preventing waste of food ad beverage.
1011.11.4 Show proper use of recipes, glassware, utensils, production sheets and other tools that help control waste.
1011.11.5 Determine menu prices using various methods.
1011.11.6 Illustrate the cost percentage formula and apply it to operational procedures.
1011.11.7 Describe and apply procedures used in planning and forecasting to control food, beverage and labor costs.

ProStart II (1012 or 1952)

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship. This second course focuses on the basics of quality table service, menu planning, industry careers and preparing certain types of foods. It also addresses the business topics of marketing, communication, accounting, purchasing, and inventory control.

Standard 1: Prepare Potatoes, Grains and Pasta (1012.S.1)

Prepare Potatoes, Grains and Pasta Objectives
Students will:
1012.1.1 Explain how to properly select, receive, and store potatoes, grains and pasta.
1012.1.2 Match different cooking methods to potatoes, grains and pasta.
1012.1.3 Prepare potatoes, grains and pasta using a variety of recipes and cooking techniques.

Standard 2: Explain the characteristics, activities, opportunities and types of lodging operations. (1012.S.2)

Lodging Operations Objectives
Students will:
1012.2.1 Define the term "lodging property" and discuss each of the characteristic types of lodging operations.
1012.2.2 List and discuss the five key elements that differentiate one lodging establishment from another.
1012.2.3 Identify the two national organizations that rate commercial lodging establishments and list a minimum of five factors used by each in making their judgments.
1012.2.4 Identify ten services offered by some, but not all, lodging properties.
1012.2.5 Discuss career opportunities in the lodging industry and the qualifications commonly sought by lodging employers.
1012.2.6 Name the activities generally accomplished at the front desk, in housekeeping, in the front office and by engineering.
1012.2.7 Describe the different types of rates and what makes them different.

Standard 3: Demonstrate the techniques necessary for quality table service. (1012.S.3)

Table Service Objectives
Students will:
1012.3.1 Set a table properly for guests arrival.
1012.3.2 Set and clear items properly.
1012.3.3 Demonstrate different service styles: American, French, English, Russian, buffet, counter and cafeteria.
1012.3.4 Describe the traditional service staff and the duties and responsibilities of each staff position.
1012.3.5 Present a guest check, receive payment, and say good-bye to guest properly.
1012.3.6 Identify various dining utensils.
1012.3.7 Perform several tableside service and food preparation techniques.
1012.3.8 Show how servers should properly identify, describe and recommend menu items to guests.

Standard 4: Prepare desserts and baked goods. (1012.S.4)

Desserts and Baked Goods Objectives
Students will:
1012.4.1 Identify the functions of basic ingredients used in desserts and breads.
1012.4.2 Describe common desserts and methods used to prepare them.
1012.4.3 Prepare various desserts and baked goods and store them properly.
1012.4.4 Bake different types of breads and quick breads.

Standard 5: Plan an effective menu. (1012.S.5)

Menu Objectives
Students will:
1012.5.1 Characterize various menu types - a la carte, table d'hôte, California, du jour, cycle - and the operations in which they are most commonly used.
1012.5.2 Write descriptions of menus items using appetizing language.
1012.5.3 Critique the physical layout of a menu.

Standard 6: Describe how marketing techniques are used in food service. (1012.

Marketing Techniques Objectives
Students will:
1012.6.1 Describe the basic marketing concepts and terms.
1012.6.2 Describe the elements of a marketing plan.
1012.6.3 Describe elements of successful community and public relations.
1012.6.4 Write and effective press release. LA
1012.6.5 Explain the various advertising media and advantages and disadvantages of each.
1012.6.6 Plan a successful promotional campaign using commonly used professional tools.

Standard 7: Practice appropriate purchasing and inventory control procedures. (1012.S.7)

Purchasing and Inventory Control Objectives
Students will:
1012.7.1 Determine when and how often to order inventory items using both perpetual and physical inventory methods
1012.7.2 Prepare purchase specifications and purchase orders for items to be purchased.
1012.7.3 Explain the formal bidding process.
1012.7.4 Describe the factors involved in selecting appropriate suppliers.
1012.7.5 Describe proper receiving procedures.
1012.7.6 Explain procedures used to issue items and keep track of inventory.

Standard 8: Prepare meats, poultry and seafood. (1012.S.8)

Meats, Poultry and Seafood Objectives
Students will:
1012.8.1 Explain the federal grading systems for meat, poultry, fish and shellfish.
1012.8.2 Describe the various forms of meat, poultry, fish and shellfish.
1012.8.3 Discuss proper procedures for receiving, storing, and handling meat, poultry, fish and shellfish.
1012.8.4 Prepare meat, poultry, fish and shellfish using a variety of cooking methods and recipes.

Standard 9: Use Standard Accounting Practices. (1012.S.9)

Accounting Objectives
Students will:
1012.9.1 Demonstrate basic accounting principles and apply them to common foodservice scenarios.
1012.9.2 Practice double-entry accounting (recording transactions in balanced T accounts).
1012.9.3 Read and interpret income statements and balance sheets
1012.9.4 Calculate cost of sales using opening and closing inventory figures.
1012.9.5 Use the balance sheet equation to determine assets, liabilities and owners equity.

Standard 10: Prepare soups, stocks and sauces. (1012.S.10)

Soups, Stocks and Sauces Objectives
Students will:
1012.10.1 List the common ingredients of and describe the proper procedure for, making a quality stock.
1012.10.2 Prepare a stock.
1012.10.3 Describe common soups and how they are prepared.
1012.10.4 Prepare various soups.
1012.10.5 Identify the major sauce families and the sauces derived from them.
1012.10.6 Prepare quality sauces using proper procedures.

Standard 11: Describe the characteristics, components and opportunities of the tourism industry. (1012.S.11)

Tourism Objectives
Students will:
1012.11.1 Describe the role of travel and tourism in the hospitality industry.
1012.11.2 Recognize career opportunities offered in travel and tourism.
1012.11.3 Distinguish the segments that make up the travel industry.
1012.11.4 Describe the kinds of customer service skills required of people who work in the travel industry.

Standard 12: Communicate well with customers. (1012.S.12)

Communications Objectives
Students will:
1012.12.1 Display basic speaking and listening skills.
1012.12.2 Use effective writing skills in all forms of written communications.
1012.12.3 Display proper and courteous telephone skills.
1012.12.4 Describe menu items effectively and demonstrate suggestive selling techniques.

Standard 13: Complete a 400-hour, off-campus, paid internship in a food service establishment. (1012.S.13)

Internship Objectives:
Students will:
1012.13.1 Develop personal qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1012.13.2 Develop long-term work qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1012.13.3 Develop short-term observable skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.

Basic Control Circuits

This course will introduce students to basic electricity fundamentals, including all related math calculations required. Ohm=s law, various circuits, reading schematic diagrams, and troubleshooting electrical circuits will be covered.

Standard 1: Troubleshoot, test, and repair or replace electrical components. (1601.S.1)

Troubleshoot, Test, And Repair Or Replace Electrical Components Objectives

Students will:

1601.1.1 Troubleshoot electrical faults on series and parallel circuit and calculate unknown values.
1601.1.2 Measure resistance of open and hermetic motor windings.
1601.1.3 Test and replace split phase motors (PSC, RSIR, CSCR, CSIR, and Shaded Pole).
1601.1.4 Test and install motor starting relays (Current, hot wire, potential, solid state).
1601.1.5 Test and replace capacitor (start and run).
1601.1.6 Test and replace contactors, switching relays, overload protectors, transformers and resistance heaters.
1601.1.7 Inspect, replace and repair switches, male and female plugs.
1601.1.8 Identify types of thermostats, test, install and adjust heat anticipators.

Domestic Refrigeration

This course covers testing, analyzing, and repair of domestic refrigeration systems (refrigerators, air conditioners, central air conditioning, and dehumidifiers).

Standard 1: Demonstrate testing & service skills for domestic refrigeration systems. (1603.S.1)

Demonstrate Testing & Service Skills For Domestic Refrigeration Systems Objectives
Students will:

1603.1.1 Label all components (electrical and mechanical) on domestic refrigeration systems.
1603.1.2 Test and replace all components (electrical and mechanical) of domestic refrigeration systems.
1603.1.3 Test and record temperature, relative humidity and pressure controls.

Fundamentals of Air Conditioning/Refrigeration

This course will introduce students to the air conditioning, and refrigeration field. Students will become familiar with the skills needed in basic compression refrigeration.

Standard 1: Identify, explore, and evaluate career opportunities related to air conditioning and refrigeration. (1605.S.1)

Career Opportunities Related to Air Conditioning and Refrigeration Objectives
Students will:

1605.1.1 Describe a variety of careers related to air conditioning and refrigeration, and the training necessary to be successful in those careers.
1605.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of air conditioning and refrigeration.
1605.1.3 Identify sources of information about careers in air conditioning and refrigeration.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to air conditioning and refrigeration. (1605.S.2)

Basic Safety Rules and Equipment Objectives
Students will:

1605.2.1 Recognize and follow general shop safety guidelines.
1605.2.2 Select and wear appropriate protective equipment.
1605.2.3 Demonstrate the proper selection and use of fire extinguishers.
1605.2.4 Identify and demonstrate proper use and care of all basic personal safety equipment.
1605.2.5 Describe safety precautions necessary when using hazardous materials.

Standard 3: Perform fabrication operations with copper, brass and steel tubing. (1605.S.3)

Fabrication Operations with Copper, Brass and Steel Tubing Objectives
Students will:

1605.3.1 Differentiate between hard and soft copper tubing.
1605.3.2 Construct a flare joint, a swage joint, and bend copper tubing to specific angles.
1605.3.3 Set up an oxyacetylene welding station, light and adjust the torch.
1605.3.4 Solder brass and copper fittings to copper tubing.
1605.3.5 Silver braze steel and copper tubing.
1605.3.6 Measure, cut and repair capillary tube.

Standard 4: Demonstrate knowledge and skills needed in compression refrigeration. (1605.S.4)

Knowledge and Skills Needed In Compression Refrigeration Objectives
Students will:

1605.4.1 Locate and label components of compression refrigeration system.
1605.4.2 Identify effect of CFC on ozone atmosphere.
1605.4.3 Install access fittings on a hermetic sealed system.
1605.4.4 Recover refrigerant, locate and repair, pressurize and leak test, evacuate, and recharge with vapor and liquid.
1605.4.5 Install manifold gauges on refrigeration systems and use a P/T chart to test compressor operation.
1605.4.6 Replace filter driers using flare fittings and sweat fittings, then triple evacuate to eliminate any moisture.
1605.4.7 Convert temperature to pressure.

Heating Systems

This course will introduce students to the basic operational theory of furnaces (gas, oil, electric, and heat pumps). Students will perform various testing and adjusting of components and circuits.

Standard 1: Demonstrate knowledge and skill needed to test, service, install and repair heating systems. (1607.S.1)

Demonstrate Knowledge And Skill Needed To Test, Service, Install And Repair Heating Systems Objectives

Students will:

1607.1.1 Test and replace all electrical and mechanical components and safety devices of heating systems.
1607.1.2 Leak test and adjust pressures of fossil fuel heating systems.
1607.1.3 Measure and adjust temperature rise of heating systems.
1607.1.4 Test and adjust combustion efficiency of fossil fuel heating systems.
1607.1.5 Check and install electric base board heating systems.
1607.1.6 Convert watts to B.T.U.=s, Celsius to Fahrenheit.
1607.1.7 Compare electric heat and heat pumps to fossil fuel heating systems.
1607.1.8 Light and adjust pilot light flame.
1607.1.9 Identify installing considerations of heating systems (up flow, down flow, and horizontal).
1607.1.10 Install fuel lines and filters for gas and oil furnaces (black pipe and copper tubing).
1607.1.11 Compute heat loss and heat gain, design duct system from blueprint information and measure airflow through duct system.

Applications For Network and Hardware WVEIS Code 1611

Content Standards for this course are under development.

Basic System Operations And Applications

WVEIS Code 1613

Content Standards for this course are under development.

Computer Construction

WVEIS Code 1615

Content Standards for this course are under development.

Servers And Network Operations

WVEIS Code 1617

Content Standards for this course are under development.

Alternative Fuels

This course will introduce students to basic electrical and automotive fundamentals related an electric vehicle including the math calculations required.

Standard 1: Demonstrate electrical safety. (1621.S.1)

Electrical Safety Objectives
Students will:
1621.1.1 Describe the effect of current on the human body.
1621.1.2 List general safety precautions when working with electricity.
1621.1.3 Identify various types of safety devices used with electricity.
1621.1.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1621.1.5 List and describe the safe use of basic hand and power tools used in the field of electricity.
1621.1.6 List and explain personal and electrical safety rules applicable to rotating equipment.

Standard 2: Interpret blueprints, schematics and technical orders. (1621.S.2)

Blueprints, Schematics and Technical Orders Objectives
Students will:
1621.2.1 Demonstrate knowledge of blueprint reading.
1621.2.2 Demonstrate knowledge of schematic reading.
1621.2.3 Draw a block diagram of a motor control system.
1621.2.4 Demonstrate knowledge of elementary wiring diagrams and ladder logic.
1621.2.5 Install motor control centers and systems, using wiring diagrams.
1621.2.6 List and identify motor and motor control symbols.

Standard 3: Apply electrical math concepts. (1621.S.3)

Electrical Math Concepts Objective
Students will:
1621.3.1 Demonstrate knowledge of Ohm's law and power formulas.

Standard 4: Demonstrate the proper use and care of electrical meters. (1621.S.4)

Electrical Meters Objective
Students will:
1621.4.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 5: Construct and analyze basic circuits. (1621.S.5)

Basic Circuits Objectives
Students will:
1621.5.1 Describe the electrical classification of conductors, insulators, and semi-conductors.
1621.5.2 Describe electrical current and differentiate between the different kinds of current.
1621.5.3 Define voltage, current, resistance, and power.
1621.5.4 List, and schematically represent the components that make up a basic electrical circuit.
1621.5.5 Connect batteries into various series and parallel arrangements and measure and record voltage readings across each configuration.
1621.5.6 Conduct experiments that demonstrate the production of an electromotive force obtaining voltage readings from experiments.
1621.5.7 Construct, solve and troubleshoot series, parallel and complex circuits.

1621.5.8 Perform various battery tests, including: state-of-charge test, capacity (load, high-rate discharge) test, and three (3) minute charge test, and determine needed service.
1621.5.9 Inspect, clean, fill, or replace battery, battery cables, connectors and clamps.
1621.5.10 Slow and fast charge conventional and maintenance free batteries.

Standard 6: Perform basic soldering techniques. (1621.S.6)

Basic Soldering Techniques Objectives
Students will:
1621.6.1 Demonstrate proper use and care for soldering tools and equipment.
1621.6.2 Demonstrate correct stripping, tinning, and soldering procedures.
1621.6.3 Identify characteristics of a good solder connection.

Standard 7: Demonstrate skills applicable to pilot devices. (1621.S.7)

Skills Applicable to Pilot Devices Objectives
Students will:
1621.7.1 Explain purpose and uses of pilot devices.
1621.7.2 Explain and list various types of electronic and mechanical sensors and pilot devices.
1621.7.3 Install and troubleshoot various pilot devices and their circuits.

Standard 8: Demonstrate skills related to motor controls. (1621.S.8)

Skills Related to Motor Controls Objectives
Students will:
1621.8.1 Explain the difference between manual and automatic circuits.
1621.8.2 List the equipment and parts needed for automatic circuits.
1621.8.3 Identify basic motor control circuits.
1621.8.4 Connect basic AC and DC circuits for automatic and manual control.
1621.8.5 Explain and demonstrate basic troubleshooting of control circuits.
1621.8.6 Install reversing circuits.
1621.8.7 Demonstrate the use of a phase rotation meter.

Standard 9: Apply skills to relays. (1621.S.9)

Apply Skills to Relays Objectives
Students will:
1621.9.1 Describe and explain relays and relay circuits.
1621.9.2 Identify and install overload relays in control circuits.
1621.9.3 Identify and install potential-type relays in control circuits.
1621.9.4 Explain the difference between relay and magnetic starters.
1621.9.5 Explain troubleshooting techniques of relay and magnetic starters.
1621.9.6 Check various relays for faults or defects.
1621.9.7 Explain, check, and adjust various types of time delay relays.

Standard 10: Differentiate between the different types of motor braking circuits. (1621.S.10)

Motor Braking Circuits Objectives
Students will:
1621.10.1 Explain the various types of braking circuits for AC and DC motors.
1621.10.2 Describe dynamic braking circuits for AC and DC motors.

Standard 11: Troubleshoot AC and DC motors. (1621.S.11)

AC and DC Motors Objectives
Students will:
1621.11.1 Describe the various types of single-phase and three-phase AC motors and DC motors.
1621.11.2 Install, check, and troubleshoot various types of DC motors in a circuit.

Standard 12: Apply calculations to assure that NEC standards are met. (1621.S.12)

NEC Standards Objectives
Students will:
1621.12.1 Calculate conductor size and ampacity, overcurrent protection, grounding, bonding, and grounded conductor size.

Standard 13: Demonstrate automotive general electrical system diagnosis. (1621.S.13)

Automotive General Electrical System Diagnosis Objectives
Students will:
1621.13.1 Identify automotive electrical symbols.
1621.13.2 Check continuity in electrical circuits with a test light.
1621.13.3 Check applied voltages and voltage drops in electrical circuits with analog and digital voltmeters.
1621.13.4 Check current flow in electrical circuits and components with an ohmmeter.
1621.13.5 Check continuity and resistance in electrical circuits and components with analog and digital ohmmeters.
1621.13.6 Find shorts and grounds in electrical circuits.
1621.13.7 Diagnose the cause(s) of a constant battery drain.
1621.13.8 Inspect, test, and replace fusible links, circuit breakers, and fuses.

Standard 14: Perform hydraulic system diagnosis and repair. (1621.S.14)

Hydraulic System Diagnosis and Repair Objectives
Students will:
1621.14.1 Check master cylinder for internal and external leaks and proper operation, determine needed repairs.
1621.14.2 Diagnose poor stopping, pulling or dragging caused by problems in the hydraulic system, determine needed repairs.
1621.14.3 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.
1621.14.4 Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed.
1621.14.5 Inspect, test, and replace components of brake warning light system.

Standard 15: Demonstrate drum brake diagnosis and repair. (1621.S.15)

Drum Brake Diagnosis and Repair Objectives
Students will:
1621.15.1 Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation problems, determine needed repairs.
1621.15.2 Remove, clean, and inspect brake drums, shoes, springs, pins, clips, levers, adjusters/self-adjusters, and backing support plates, service, lubricate and reassemble.
1621.15.3 Pre-adjust brake shoes and parking brake before installing brake drums or drum and hub assemblies, and wheel bearings.

Standard 16: Demonstrate disc brake diagnosis and repair. (1621.S.16)

Disc Brake Diagnosis and Repair Objectives

Students will:

1621.16.1 Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation caused problems, determine needed repairs.

1621.16.2 Remove caliper assembly and brake pads from mountings; clean and inspect for leaks and damage to caliper housing. Inspect parts for wear, rust, scoring, and damage; replace seal, boot or worn parts. Clean and inspect caliper mounting and slides for wear and damage.

1621.16.3 Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace.

1621.16.4 Reinstall wheel, torque lug nuts, and make final checks and adjustments.

Standard 17: Perform diagnosis and repair of miscellaneous items. (1621.S.17)

Diagnosis and Repair of Miscellaneous Items Objectives

Students will:

1621.17.1 Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.

1621.17.2 Remove, clean, inspect, re-pack, and reinstall wheel bearings, replace seals, reinstall hub, adjust wheel bearings. Replace bearing and race as needed.

1621.17.3 Check parking brake operation, cables and components for wear, rusting, binding, corrosion and clean, lubricate and replace as needed.

1621.17.4 Check operation of brake stop light system; adjust and service as needed.

Standard 18: Perform diagnosis and adjust wheel alignment. (1621.S.18)

Diagnosis and Adjust Wheel Alignment Objectives

Students will:

1621.18.1 Check and adjust front and rear wheel camber, caster, toe, SAI (steering axis inclination) and determine needed repairs.

1621.18.2 Check rear wheel thrust angle; determine needed repairs.

1621.18.3 Check for front wheel setback; determine needed repairs.

1621.18.4 Check front cradle (sub-frame) alignment; determine needed repairs.

Standard 19: Perform diagnosis and repair of wheels and tires. (1621.S.19)

Diagnosis and Repair of Wheels and Tires Objectives

Students will:

1621.19.1 Inspect tires; check and adjust air pressure. Diagnose tire wear patterns and determine needed repairs. Rotate tires according to manufacturer's recommendations.

1621.19.2 Measure wheel, tire, axle, and hub run-out; determine needed repairs.

1621.19.3 Dismount, inspect, repair, and remount tire on wheel. Balance wheel and tire assembly (static and dynamic). Reinstall wheel; torque lug nuts.

Standard 20: Perform clutch diagnosis and repair. (1621.S.20)

Clutch Diagnosis and Repair Objectives

Students will:

1621.20.1 Diagnose clutch noise, binding, slippage, pulsation, and chatter problems; determine needed repairs.

1621.20.2 Inspect, adjust or replace clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, springs, hydraulic clutch slave and master cylinders, lines, and hoses.

1621.20.3 Inspect, adjust or replace release (throw-out) bearing, lever and pivot, crankshaft pilot bearing

or bushing (as applicable), clutch pressure plate assembly and clutch disc.

1621.20.4 Inspect, repair, and service or replace flywheel and ring gear. Measure flywheel-to-block run out and crankshaft end play; determine needed repairs.

1621.20.5 Inspect engine block, clutch (bell) housing, and transmission case mating surfaces; measure clutch (bell) housing bore-to-crankshaft run out and face squareness; determine needed repairs.

Standard 21: Troubleshoot and repair lighting systems. (1621.S.21)

Repair Lighting Systems Objectives

Students will:

1621.21.1 Diagnose brighter than normal, intermittent, dim or no light operation.

1621.21.2 Inspect, replace, and aim headlights and bulbs.

1621.21.3 Inspect and diagnose incorrect turn signal or hazard light operations; repair or replace as needed.

Standard 22: Perform diagnosis and repair of driver information systems. (1621.S.22)

Driver Information Systems Objectives

Students will:

1621.22.1 Diagnose intermittent, high, low, no gauge readings, or no readings on electronic instrument clusters, test sensors, sending units, connectors, and wires of electronic instrument circuits.

1621.22.2 Test gauge circuit voltage regulators (limiters); replace as needed.

1621.22.3 Inspect and test gauges and gauge sending units, connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.

1621.22.4 Diagnose incorrect operation of warning devices and other driver information systems.

Standard 23: Perform accessories diagnosis and repair. (1621.S.23)

Accessories Diagnosis and Repair Objectives

Students will:

1621.23.1 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; repair as needed.

1621.23.2 Diagnose incorrect operation of motor-driven accessory circuits, heated glass operation, electric door and hatch/trunk lock operation and cruise control systems.

1621.23.3 Diagnose supplemental restraint system (SRS) problems; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.)

1621.23.4 Diagnose radio static and weak, intermittent, or no radio reception.

Basic Engine Concepts

This course will introduce students to basic engine concepts, skills, technology and service of the automobile.

Standard 1: Perform general engine diagnosis, removal and reinstallations (R&R). (1623.S.1)

General Engine Diagnosis, Removal and Reinstallations (R&R) Objectives
Students will:

1623.1.1 Interpret and verify complaint; listen to engine noises; inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed repairs.
1623.1.2 Diagnose the cause of excessive oil consumption, unusual engine exhaust color, odor, and sound; determine needed repairs.
1623.1.3 Perform engine vacuum tests; determine needed repairs.
1623.1.4 Perform cylinder power balance tests; cylinder compression tests; cylinder leakage tests; determine needed repairs.
1623.1.5 Remove engine (front-wheel drive); prepare for disassembly; reinstall engine.

Standard 2: Demonstrate cylinder head and valve train diagnosis and repair. (1623..S.2)

Cylinder Head and Valve Train Diagnosis and Repair Objectives
Students will:

1623.2.1 Remove cylinder head(s); inspect cylinder head(s) for cracks; check gasket surface areas for warpage and leakage; check passage condition.
1623.2.2 Install cylinder heads and gaskets; tighten according to manufacturer's specifications and procedures.
1623.2.3 Inspect and test valve springs for squareness, pressure, and free height comparison; inspect valve spring retainers, locks, and valve grooves; replace as needed. Replace valve stem seals.
1623.2.4 Inspect valve guides for wear; check valve guide height and stem-to-guide clearance; inspect valves; inspect valve seats; recondition or replace as needed.
1623.2.5 Check valve face-to-seat contact and valve seat concentricity (run out), service seats and valves as needed.
1623.2.6 Check valve spring-assembled height and valve stem height; service valve and spring assemblies as needed.
1623.2.7 Inspect pushrods, rocker arms, rocker arm pivots and shaft for wear, bending, cracks, looseness, and blocked oil passages (orifices); repair or replace.
1623.2.8 Inspect hydraulic or mechanical lifters; replace as needed. Adjust valves (mechanical or hydraulic lifters).
1623.2.9 Inspect and replace camshaft drives (including gear wear and backlash, sprocket and chain wear, overhead cam drive sprockets, drive belts, belt tension, and tensioners).
1623.2.10 Inspect camshaft for run out, measure journals and lobes for wear.
1623.2.11 Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed repairs.
1623.2.12 Verify camshaft(s) timing according to manufacturer's specifications and procedure.

Standard 3: Perform engine block diagnosis and repair. (1623.S.3)

Engine Block Diagnosis and Repair Objectives
Students will:

1623.3.1 Inspect and replace pans, covers, gaskets, and seals.
1623.3.2 Inspect engine block for cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed repairs.

1623.3.3 Inspect internal and external threads; repair as needed.
1623.3.4 Inspect and measure cylinder walls for damage and wear; determine needed repairs. Remove cylinder wall ridges. Deglaze and clean cylinder walls.
1623.3.5 Inspect crankshaft for surface cracks and journal damage; check oil passage condition; measure journal wear; determine needed repairs.
1623.3.6 Inspect and measure main and connecting rod bearings for damage, clearance, and end play; determine needed repairs (includes the proper selections of bearings).
1623.3.7 Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; inspect rod alignment and bearing bore condition.
1623.3.8 Inspect, measure, service or replace pistons. Inspect, measure, and install piston rings.
1623.3.9 Inspect, repair or replace crankshaft vibrations damper (harmonic balancer).
1623.3.10 Inspect flywheel or flex plate and ring gear for cracks and wear; measure run out and determine needed repairs.
1623.3.11 Inspect, remove, and replace crankshaft pilot bearing or bushing (as applicable).
1623.3.12 Reassemble engine components using correct gaskets and sealants.
1623.3.13 Inspect auxiliary (balance, intermediate, idler, counterbalance or silencer) shaft(s); inspect shaft(s) and support bearings for damage and wear; determine needed repairs; reinstall and time.
1623.3.14 Prime engine lubrication system.

Standard 4: Perform lubrication and cooling systems diagnosis and repair. (1623.S.4)

Cooling Systems Diagnosis and Repair Objectives
Students will:
1623.4.1 Perform oil pressure tests; inspect oil pump ears or rotors, housing, pressure relief devices, and pump drive; replace as needed.
1623.4.2 Perform cooling system tests (pressure, combustion leakage, and temperature) determine needed repairs.
1623.4.3 Inspect, replace, and adjust drive belts and pulleys.
1623.4.4 Inspect and replace engine cooling and heater system hoses.
1623.4.5 Inspect, test, and replace thermostat and housing.
1623.4.6 Inspect coolant; drain, flush, and refill cooling system with recommended coolant and bleed air as required.
1623.4.7 Inspect, test, remove, and replace water pump.
1623.4.8 Inspect and test radiator, pressure cap, and coolant recovery system; remove and replace radiator.
1623.4.9 Clean, inspect, and test fan(s) (electrical or mechanical), inspect and test electrical fan control system and circuits, fan clutch, fan shroud and air dams.
1623.4.10 Inspect, test, and replace oil temperature and pressure switches and sensors. Inspect auxiliary oil coolers; replace as needed.
1623.4.11 Perform oil and filter change.

Brakes

This course will introduce students to the basic fundamental skills, technology, and service of automotive brake systems. Students will comply with personal and environmental safety practices associated with proper ventilation, handling, storage, and disposal of brake components.

Standard 1: Perform hydraulic system diagnosis and repair. (1625.S.1)

Hydraulic System Diagnosis and Repair Objectives
Students will:

1625.1.1 Check master cylinder for internal and external leaks and proper operation; determine needed repairs.
1625.1.2 Remove, bench bleed, and replace master cylinders.
1625.1.3 Diagnose poor stopping, pulling or dragging caused by problems in the hydraulic system; determine needed repairs.
1625.1.4 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports.
1625.1.5 Fabricate and install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed.
1625.1.6 Select, handle, store, and install brake fluids to proper level. Bleed (manual, pressure, vacuum or surge) brake system; flush hydraulic system.
1625.1.7 Inspect, test, and replace metering (hold-off), proportioning (balance), pressure differential, and combinations valves.
1625.1.8 Inspect, test, replace and adjust height (load) sensing proportioning valve.
1625.1.9 Inspect, test, and replace components of brake warning light system.

Standard 2: Demonstrate drum brake diagnosis and repair. (1625.S.2)

Drum Brake Diagnosis and Repair Objectives
Students will:

1625.2.1 Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation problems; determine needed repairs.
1625.2.1 Remove, clean (using proper safety procedures), inspect, and measure brake drums. Service (mount brake drum on lathe and machine) or replace as needed.
1625.2.3 Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, and backing support plates; lubricate/reassemble.
1625.2.4 Remove and reinstall wheel cylinders.
1625.2.5 Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings.

Standard 3: Demonstrate disc brake diagnosis and repair. (1625.S.3)

Disc Brake Diagnosis and Repair Objectives
Students will:

1625.3.1 Diagnose poor stopping, noise, pulling, grabbing, dragging, or pedal pulsation caused problems; determine needed repairs.
1625.3.2 Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing. Inspect parts for wear, rust, scoring, and damage; replace seal, boot or worn parts. Clean and inspect caliper mounting and slides for wear and damage.
1625.3.3 Remove, clean, and inspect pads and retaining hardware; determine needed service. Reassemble, lubricate, and reinstall caliper, pads, and related hardware.
1625.3.4 Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace.

1625.3.5 Adjust calipers with integrated parking brake system. Fill master cylinder with recommended fluid and seat pads; inspect caliper for leaks.
1625.3.6 Reinstall wheel, torque lug nuts, and make final checks and adjustments.

Standard 4: Perform diagnosis and repair of power assist units. (1625.S.4)

Power Assist Units Objectives
Students will:
1625.4.1 Test pedal free travel with and without engine running; check power assist operation.
1625.4.2 Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.
1625.4.3 Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; repair or replace parts as needed.

Standard 5: Perform diagnosis and repair of miscellaneous items. (1625.S.5)

Diagnosis and Repair of Miscellaneous Items Objectives
Students will:
1625.5.1 Diagnose wheel bearing noises, wheel shimmy, and vibration problems; determine needed repairs.
1625.5.2 Remove, clean, inspect, re-pack, and reinstall wheel bearings and replace seals; reinstall hub and adjust wheel bearings. Replace wheel bearing and race as needed.
1625.5.3 Check parking brake cables and components for wear, rusting, binding, corrosion and clean, lubricate and replace as needed.
1625.5.4 Check parking brake operation; adjust as needed. Check operation of parking brake indicator light system.
1625.5.5 Check operation of brake stop light system; adjust and service as needed.

Standard 6: Perform diagnosis and repair of an anti-lock brake system. (1625.S.6)

Anti-Lock Brake System Objectives
Students will:
1625.6.1 Inspect, test, and service anti-lock brake system (ABS) hydraulic, electrical, and mechanical components. Observe anti-lock brakes system (ABS) warning light(s) at startup; determine if further diagnosis is needed.
1625.6.2 Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise problems caused by the anti-lock brake system (ABS); determine needed repairs.
1625.6.3 Diagnose anti-lock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine needed repairs.
1625.6.4 Depressurize high pressure components of the anti-lock brake system (ABS) following manufacturer's recommended safety procedures.
1625.6.5 Fill and bleed the anti-lock brake system's (ABS) front and rear hydraulic circuits and master cylinder with recommended fluid following manufacturer's procedures; inspect system for leaks.
1625.6.6 Perform a fluid pressure (hydraulic boost) diagnosis on the high pressure anti-lock brake system (ABS); determine needed repairs.
1625.6.7 Remove and install anti-lock brake system (ABS) electrical/electronic and hydraulic components following manufacturer's procedures and specifications.
1625.6.8 Service, test, and adjust anti-lock brake system (ABS) speed sensors following manufacturer's recommended procedures
1625.6.9 Diagnose anti-lock brake system (ABS) braking problems caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).

Electrical/Electronic Systems

This course will introduce students to the skills, technology, and service of electrical/electronic systems of the automobile.

Standard 1: Demonstrate general electrical system diagnosis. (1627.S.1)

General Electrical System Diagnosis Objectives

Students will:

1627.1.1 Use wiring diagrams during diagnosis of electrical circuit problems.
1627.1.2 Check electrical circuits with a test light; determine needed repairs.
1627.1.3 Check voltage and voltage drop in electrical/electronic circuits using a digital multi meter (DMM) and current flow in electrical/electronic circuits and components using an ammeter.
1627.1.4 Check electrical circuits using jumper wires; determine needed repairs.
1627.1.5 Find shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine needed repairs.
1627.1.6 Measure and diagnose the cause(s) of abnormal key-off battery drain; repair as needed.
1627.1.7 Inspect and test fusible links, circuit breakers, and fuses; replace as needed.
1627.1.8 Inspect and test switches, connectors, relays, and wires of electrical/electronic circuits; repair or replace as needed.

Standard 2: Apply battery diagnosis and service. (1627.S.2)

Battery Diagnosis and Service Objectives

Students will:

1627.2.1 Perform battery state-of-charge test and perform slow/fast battery charge.
1627.2.2 Perform battery capacity (load, high-rate discharge) test and determine needed service.
1627.2.3 Maintain or restore electronic memory functions.
1627.2.4 Inspect, clean, fill and replace battery, clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.
1627.2.5 Start a vehicle using jumper cables and a battery or auxiliary power supply.

Standard 3: Demonstrate starting system diagnosis and repair. (1627.S.3)

Starting System Diagnosis and Repair Objectives

Students will:

1627.3.1 Perform starter current draw and circuit voltage drop test; determine needed repairs.
1627.3.2 Inspect and test starter relays and solenoids; replace as needed.
1627.3.3 Remove and replace/reinstall starter.
1627.3.4 Perform starter bench tests; determine needed repairs.
1627.3.5 Inspect, test, and repair or replace switches, connectors, and wires of starter control circuits.
1627.3.6 Disassemble, clean, inspect, and test starter components; replace as needed.

Standard 4: Perform charging system diagnosis and repair. (1627.S.4)

Charging System Diagnosis and Repair Objectives

Students will:

1627.4.1 Diagnose charging system problems that cause an undercharge, a no-charge or an overcharge condition. Perform charging circuit voltage drop tests.
1627.4.2 Inspect and adjust alternator drive belts; replace as needed.
1627.4.3 Inspect and test voltage regulator; replace as needed.
1627.4.4 Remove, inspect, and replace/reinstall alternator.
1627.4.5 Disassemble, clean, inspect, and test alternator components; replace as needed.

Standard 5: Troubleshoot lighting systems, diagnosis and repair. (1627.S.5)

Lighting Systems, Diagnosis and Repair Objectives
Students will:
1627.5.1 Diagnose brighter than normal, intermittent, dim or no light operation.
1627.5.2 Inspect, replace, and aim headlights and bulbs.
1627.5.3 Inspect and diagnose incorrect turn signal or hazard light operations; repair or replace as needed.

Standard 6: Perform diagnosis and repair of driver information systems. (1627.S.6)

Driver Information Systems Objectives
Students will:
1627.6.1 Diagnose intermittent, high, low, no gauge readings, or no readings on electronic instrument clusters, test sensors, sending units, connectors, and wires of electronic instrument circuits.
1627.6.2 Test gauge circuit voltage regulators (limiters); replace as needed.
1627.6.3 Inspect and test gauges and gauge sending units, connectors, wires, and printed circuit boards of gauge circuits; repair or replace as needed.
1627.6.4 Diagnose incorrect operation of warning devices and other driver information systems.

Standard 7: Perform diagnosis and repair of horn and wiper/washer. (1627.S.7)

Horn and Wiper/Washer Objectives
Students will:
1627.7.1 Diagnose incorrect horn operation; repair as needed.
1627.7.2 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; repair as needed.
1627.7.3 Diagnose incorrect windshield washer operation; repair as needed.

Standard 8: Perform accessories diagnosis and repair. (1627.S.8)

Accessories Diagnosis and Repair Objectives
Students will:
1627.8.1 Diagnose incorrect operation of motor-driven accessory circuits, heated glass operation, electric door and hatch/trunk lock operation and cruise control systems.
1627.8.2 Diagnose supplemental restraint system (SRS) problems; repair as needed. (Note: Follow manufacturer's safety procedures to prevent accidental deployment.
1627.8.3 Diagnose radio static and weak, intermittent, or no radio reception.

Engine Performance

This course will introduce students to the skills, technology, and service of electrical/electronic systems of the automobile. Students will comply with personal and environmental safety practices associated with proper ventilation and the handling, storage, and disposal of chemicals in accordance with local, state, and federal safety and environmental regulations.

Standard 1: Perform general engine diagnosis. (1629.S.1)

General Engine Diagnosis Objectives
Students will:

1629.1.1 Interpret and verify complaint, inspect engine assembly for fuel, oil, coolant, and other leaks.
1629.1.2 Diagnose unusual engine noise or vibrations problems, unusual exhaust color, odor or sound.
1629.1.3 Perform engine absolute (vacuum/boost) manifold pressure tests; determine needed repairs.
1629.1.4 Perform cylinder power balance test, cylinder compression test and cylinder leakage test.
1629.1.5 Diagnose engine mechanical, electrical, electronic, fuel, and ignition problems with an oscilloscope and engine diagnostic equipment; determine needed action.
1629.1.6 Prepare a 4 or 5 gas analyzer; inspect and prepare vehicle for test and obtain exhaust readings; interpret readings and determine needed action.

Standard 2: Perform computerized engine controls diagnosis and repair. (1629.S.2)

Computerized Engine Controls Diagnosis and Repair Objectives
Students will:

1629.2.1 Diagnose emissions or driveability problems resulting from failure of computerized engine controls with no diagnostic trouble codes stored; determine needed repairs.
1629.2.2 Retrieve and record stored diagnostic trouble codes and diagnose the causes of emissions or driveability problems resulting from failure of computerized engine controls.
1629.2.3 Inspect, test, adjust, and replace computerized engine control system sensors, powertrain control module (PCM), actuators, and circuits.
1629.2.4 Obtain and interpret digital multimeter (DMM) readings.
1629.2.5 Access and use electronic service information (ESI).
1629.2.6 Locate and interpret vehicle and major component identifications numbers, (VIN, vehicle certification labels and calibration decals).
1629.2.7 Inspect and test power and ground circuits and connections and practice recommended precautions when handling static sensitive devices.
1629.2.8 Diagnose driveability and emissions problems resulting from failures of interrelated systems (cruise control, security alarms, torque controls, suspension controls, traction controls, torque management, A/C, automatic transmissions, and similar systems); determine needed repairs.

Standard 3: Perform diagnosis and repair of ignition system. (1629.S.3)

Ignition System Objectives
Students will:

1629.3.1 Diagnose no-starting, driveability, and emissions problems on vehicles with electronic ignition (distributor-less) systems and on vehicles with distributor ignition (DI) systems.
1629.3.2 Inspect and test ignition primary circuit wiring and components, distributor, ignition system secondary circuit wiring and components and ignition coil(s).
1629.3.3 Check and adjust (where applicable) ignition system timing and timing advance/retard.
1629.3.4 Inspect and test ignition wiring harness and connectors, ignition system pick-up sensor or triggering devices and ignition control module.

Standard 4: Perform fuel, air induction, and exhaust systems diagnosis and repair. (1629.S.4)

Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair Objectives

Students will:

1629.4.1 Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems on vehicles with carburetor-type fuel systems and injection-type fuel systems.

1629.4.2 Inspect fuel tank and fuel cap, replace fuel filter, fuel lines, fittings, and hoses. Check fuel for contaminants and quality.

1629.4.3 Inspect and test mechanical and electrical fuel pumps and pump control systems; replace as needed.

1629.4.4 Inspect and test fuel pressure regulations system and components of injection-type fuel systems and test cold enrichment system components.

1629.4.5 Remove, clean, and reinstall throttle body, adjust related linkages and inspect throttle body mounting plates, air induction and filtration system, intake manifold, and gaskets.

1629.4.6 Inspect and test fuel injectors; clean and replace.

1629.4.7 Check/adjust idle speed and fuel mixture where applicable.

1629.4.8 Remove, inspect, and test vacuum and electrical components and connections of fuel system; repair or replace as needed.

1629.4.9 Inspect exhaust manifold, exhaust pipes, mufflers, resonators, tail pipes, and heat shields; repair or replace as needed.

1629.4.10 Perform exhaust system back-pressure test; determine needed action.

1629.4.11 Test the operation of turbocharger/supercharger systems, remove, clean, inspect and repair or replace turbocharger/supercharger system components and identify the causes of turbocharger/supercharger failure.

Standard 5: Demonstrate emissions control systems diagnosis and repair. (1629.S.5)

Emissions Control Systems Diagnosis and Repair Objectives

Students will:

1629.5.1 Inspect and test positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, hoses and diagnose oil leaks, emissions, and driveability problems resulting from failure of the positive crankcase ventilation (PCV) system.

1629.5.2 Diagnose emissions and driveabiliity problems cause by failure of the exhaust gas re-circulation (EGR) system, inspect and test valve, valve manifold, and exhaust passages, vacuum/pressure controls, filters, and hoses, electrical/electronic sensors, controls, and wiring.

1629.5.3 Inspect and test components of catalytic converter systems, diagnose emissions and driveability problems resulting from failure of the secondary air injection and catalytic converter systems, mechanical components of secondary air injection systems, electrical/electronically-operated components and circuits of the air injection systems.

1629.5.4 Inspect and test components of intake air temperature control system, and diagnose emissions and driveability problems resulting from failure of the intake air temperature control system.

1629.5.5 Inspect and test components of early fuel evaporation control system, and diagnose emissions and driveability problems resulting from failure of the early fuel evaporation control system.

1629.5.6 Adjust valves on engines with mechanical or hydraulic lifters.

1629.5.7 Verify correct camshaft timing; determine needed action.

1629.5.8 Verify engine operating temperature; determine needed action.

1629.5.9 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; service or replace as needed.

1629.5.10 Inspect and test thermostat, by-pass, and housing; replace as needed.

1629.5.11 Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; service or replace as needed.

Fundamentals Of Automotive Technology

This course will introduce students to the basic skills in automotive technology/ service. Students will become familiar with fundamentals of automotive technology and basic automotive electrical systems.

Standard 1: Identify, explore, and evaluate career opportunities related to automotive technology. (1631.S.1)

Career Opportunities Related to Automotive Technology Objectives
Students will:
1631.1.1 Describe a variety of careers related to automotive technology, and the training necessary to be successful in those careers.
1631.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of automotive technology.
1631.1.3 Identify sources of information about careers in automotive technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to automotive technology. (1631.S.2)

Automotive Technology Objectives
Students will:
1631.2.1 Recognize and follow general shop safety guidelines.
1631.2.2 Select and wear appropriate protective equipment.
1631.2.3 Demonstrate the proper selection and use of fire extinguishers.
1631.2.4 Identify and demonstrate proper use and care of all basic personal safety equipment.
1631.2.5 Describe safety precautions necessary when using hazardous materials.
1631.2.6 Explain the OSHA "Right to Know" law.
1631.2.7 Conduct safety inspections in the lab.

Standard 3: Identify basic hand and power tools and demonstrate safe and appropriate use. (1631.S.3)

Basic Hand and Power Tools Objectives
Students will:
1631.3.1 Choose the proper hand tools for given applications, and describe the proper care and maintenance of each.
1631.3.2 Demonstrate any adjustments possible with each tool.
1631.3.3 Choose proper power tools for given application, and demonstrate proper care and maintenance of each.
1631.3.4 Make necessary adjustments to power tools.
1631.3.5 Recognize and identify appropriate blade or bit for given situation, and demonstrate the ability to change blades and bits on cutting tools.

Standard 4: Demonstrate a working knowledge of general electrical system diagnosis. (1631.S.4)

General Electrical System Diagnosis Objectives
Students will:
1631.4.1 Identify automotive electrical symbols.
1631.4.2 Check continuity in electrical circuits with a test light.
1631.4.3 Check applied voltages and voltage drops in electrical circuits with analog and digital voltmeters.
1631.4.4 Check current flow in electrical circuits and components with an ohmmeter.

1631.4.5 Check continuity and resistance in electrical circuits and components with analog and digital ohmmeters.
1631.4.6 Find shorts and grounds in electrical circuits.
1631.4.7 Diagnose the cause(s) of a constant battery drain.
1631.4.8 Inspect, test, and replace fusible links, circuit breakers, and fuses.

Standard 5: Demonstrate battery diagnosis and service. (1631.S.5)

Battery Diagnosis and Service Objectives
Students will:
1631.5.1 Perform various battery tests, including: state-of-charge test, capacity (load, high-rate discharge) test, and three (3) minute charge test, and determine needed service.
1631.5.2 Inspect, clean, fill, or replace battery, battery cables, connectors and clamps.
1631.5.3 Slow and fast charge conventional and maintenance free batteries.
1631.5.4 Jump start a vehicle with jumper cables and a booster battery or auxiliary power supply.

Standard 6: Demonstrate starting system diagnosis and repair procedures. (1631.S.6)

Starting System Diagnosis and Repair Procedures Objectives
Students will:
1631.6.1 Perform starter current draw test and starter circuit voltage drop test: determine needed repairs.
1631.6.2 Inspect, test, and repair or replace switches, connectors, and wires of starter control circuits.
1631.6.3 Inspect, test, and replace starter relays and solenoids.
1631.6.4 Remove and replace starter.
1631.6.5 Disassemble and clean starter components, inspect and replace starter drive, inspect and replace starter brushes and brush holders, inspect and replace starter bushings and end frames, inspect and test starter field coils and inspect, test, and replace starter armature.
1631.6.6 Perform starter free-running (bench) tests; determine needed repairs.

Standard 7: Identify and repair charging system components. (1631.S.7)

Charging System Components Objectives
Students will:
1631.7.1 Diagnose charging system problems that cause an overcharge, undercharge or a no-charge condition.
1631.7.2 Inspect, adjust, and replace alternator drive belts, pulleys, and fans.
1631.7.3 Perform charging system output test; determine needed repairs.
1631.7.4 Perform alternator output test; determine needed repairs.
1631.7.5 Remove and replace regulator.

Heating and Air Conditioning

This course will introduce students to the heating and air conditioning systems of the automobile. Students will comply with personal and environmental safety practices associated with the handling, storage, and disposal of chemicals in accordance with local, state, and federal safety regulations.

Standard 1: Perform diagnosis and repair of A/C system. (1633.S.1)

Perform Diagnosis and Repair of A/C System Objectives
Students will:

1633.1.1 Diagnose unusual operating noises in the A/C system; determine needed repairs.
1633.1.2 Conduct performance test of the A/C system; determine needed repairs.
1633.1.3 Leak test A/C system; determine needed repairs.
1633.1.4 Inspect the condition of discharged oil. Select oil type; measure and add oil to the A/C system as needed.

Standard 2: Perform refrigeration system component diagnosis and repair. (1633.S.2)

Refrigeration System Component Diagnosis and Repair Objectives
Students will:

1633.2.1 Diagnose A/C system problems that cause the protection devices (pressure, thermal, and PCM) to interrupt system operations; determine needed repairs.
1633.2.2 Inspect A/C compressor drive belts; replace and adjust as needed.
1633.2.3 Inspect, test, and replace A/C compressor clutch components or assembly.
1633.2.4 Remove and replace A/C compressor and mountings.
1633.2.5 Inspect and replace A/C compressor shaft seal assembly.
1633.2.6 Diagnose A/C system problems caused by too much moisture in the refrigerant; determine needed repairs.
1633.2.7 Install A/C system filter. Remove and inspect A/C system mufflers, hoses, lines, fittings, 0-rings, seals, and service valves; replace as needed.
1633.2.8 Inspect A/C condenser for air flow restrictions; service as required.
1633.2.9 Inspect receiver/drier or accumulator/drier; service as needed.
1633.2.10 Inspect and test expansion valve or orifice (expansion) tube; replace as needed.
1633.2.11 Inspect evaporator housing water drain; repair as needed.

Standard 3: Perform diagnosis and repair of heating and engine cooling systems. (1633.S.3)

Heating and Engine Cooling Systems Objectives
Students will:

1633.3.1 Diagnose temperature control problems in the heater/ventilation system; determine needed repairs.
1633.3.2 Perform cooling system, cap, and recovery system tests (pressure, combustion leakage, and temperature); determine needed repairs.
1633.3.3 Inspect engine cooling and heater system hoses and belts; replace as needed.
1633.3.4 Inspect, test, and replace thermostat and housing.
1633.3.5 Determine coolant condition; drain and recover. Flush system and refill with recommended coolant; bleed system.
1633.3.6 Clean, inspect and test fan, fan clutch (electrical and mechanical), fan shroud, and air dams; replaces as needed.
1633.3.7 Inspect and test heater control valve(s); replace as needed.

Standard 4: Perform operating systems and related controls diagnosis and repair. (1633.S.4)

Operating Systems and Related Controls Diagnosis and Repair Objectives
Students will:

1633.4.1 Diagnose failures in the electrical controls of heating and A/C systems; determine needed repairs.
1633.4.2 Inspect and test A/C - heater blower, motors, resistors, switches, relays, wiring, and protection devices; repair or replace as needed.
1633.4.3 Test A/C compressor load cut-off systems; determine needed repairs.
1633.4.4 Diagnose failures in the vacuum and mechanical controls of the heating and A/C system; determine needed repairs.
1633.4.5 Inspect and test A/C -heater control panel assembly; inspect and test A/C-heater control cables and linkages; replace as needed.
1633.4.6 Inspect and test A/C-heater vacuum control switches, hoses, diaphragms (motors), vacuum reservoir, check valve, and restrictors; replace as needed.
1633.4.7 Check operation of automatic and semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine needed repairs.

Standard 5: Perform refrigerant recovery, recycling and handling. (1633.S.5)

Refrigerant Recovery, Recycling and Handling Objectives
Students will:

1633.5.1 Verify correct operation and maintenance of refrigerant handling equipment. Identify and recover A/C system refrigerant.
1633.5.2 Recycle, label and store refrigerant.
1633.5.3 Test recycled refrigerant for non-condensable gases.
1633.5.4 Evacuate and charge A/C system.

Manual/Automatic Drive Train Axles

This course will introduce students to the manual/automatic drive train and axle systems of the automobile.

Standard 1: Apply clutch diagnosis and repair. (1635.S.1)

Clutch Diagnosis and Repair Objectives
Students will:

1635.1.1 Diagnose clutch noise, binding, slippage, pulsation, and chatter problems; determine needed repairs.

1635.1.2 Inspect, adjust or replace clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, springs, hydraulic clutch slave and master cylinders, lines, and hoses.

1635.1.3 Inspect, adjust or replace release (throw-out) bearing, lever and pivot, crankshaft pilot bearing or bushing (as applicable), clutch pressure plate assembly and clutch disc.

1635.1.4 Inspect, repair, and service or replace flywheel and ring gear. Measure flywheel-to-block runout and crankshaft end play; determine needed repairs.

1635.1.5 Inspect engine block, clutch (bell) housing, and transmission case mating surfaces; measure clutch (bell) housing bore-to-crankshaft runout and face squareness; determine needed repairs.

Standard 2: Demonstrate manual transmission diagnosis and repair. (1635.S.2)

Manual Transmission Diagnosis and Repair Objectives
Students will:

1635.2.1 Diagnose transmission noise, hard shifting, jumping out of gear, and fluid leakage problems; determine needed repairs.

1635.2.2 Inspect, adjust, and replace transmission shift linkages, brackets, bushings, cables, pivots, and levers. Inspect, replace, and align power train mounts.

1635.2.3 Inspect and replace transmission gaskets, seals, and sealants; inspect sealing surfaces.

1635.2.4 Remove, disassemble, clean, reassemble transmission components and reinstall transmission.

1635.2.5 Inspect, adjust, and reinstall transmission shift cover, forks, grommets, levers, shafts, sleeves, detent mechanisms, interlocks, and springs. Inspect lubrication devices (oil pump or slingers).

1635.2.6 Inspect and replace speedometer drive gear, driven gear, vehicle speed sensor (VSS) and retainers.

1635.2.7 Inspect, repair, and replace extension housing and transmission case mating surfaces, bores, bushings, and vents.

Standard 3: Perform transaxle diagnosis and repair. (1635.S.3)

Transaxle Diagnosis and Repair Objectives
Students will:

1635.3.1 Diagnose transaxle noise, hard shifting, jumping out of gear, and fluid leakage problems; determine needed repairs.

1635.3.2 Inspect, adjust, and reinstall transaxle shift linkages, brackets, bushings, cables, pivots, and levers. Inspect and reinstall power train mounts.

1635.3.3 Inspect and replace transaxle gaskets, seals, and sealants; inspect sealing surfaces.

1635.3.4 Remove and reinstall transaxle and replace final drive.

1635.3.5 Inspect, adjust and reinstall transaxle shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks and springs, input (clutch) shaft and bearings, output shaft,

gears, thrust washers, bearings, and retainers.

1635.3.6 Measure end play or preload (shim or spacer selection procedure) on transaxle shafts; adjust as needed.

1635.3.7 Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings, reverse idler gear, shaft, bearings, thrust washers, and retainers.

1635.3.8 Inspect transaxle case, mating surfaces, bores, bushings, and vents.

1635.3.9 Inspect and reinstall speedometer drive gear, driven gear, vehicle speed sensor (VSS), and retainers, inspect, measure, adjust, and reinstall differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly. Inspect lubrication devices (oil pump or slingers).

1635.3.10 Diagnose differential assembly noise and vibration problems; determine needed repairs.

Standard 4: Perform diagnosis and repair of universal and constant-velocity (CV) joint. (1635.S.4)

Universal and Constant-Velocity (CV) Joint Objectives

Students will:

1635.4.1 Diagnose constant-velocity (CV) joint/ universal joint noise and vibrations problems; determine needed repairs.

1635.4.2 Diagnose front wheel drive (FWD) front wheel bearing noise and vibration problems.

1635.4.3 Inspect, service, and replace shafts, yokes, boots, and shaft center support bearings.

1635.4.4 Check and correct shaft balance; measure shaft runout; measure and adjust driveline angles.

Standard 5: Perform ring and pinion gears and differential case assembly. (1635.S.5)

Ring and Pinion Gears and Differential Case Assembly Objectives

Students will:

1635.5.1 Diagnose ring and pinion gears noise and vibrations and fluid leakage problems.

1635.5.2 Inspect and replace companion flange and pinion seal; measure companion flange runout.

1635.5.3 Inspect ring gear, pinion gear, spacers, sleeves, and bearings and measure runout. Measure and adjust drive pinion depth, pinion bearing preload, side bearing preload and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup and shim types).

1635.5.4 Disassemble, inspect, measure, and adjust or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case. Check ring and pinion tooth contact patterns; adjust as needed.

1635.5.5 Reassemble and reinstall differential case assembly; measure runout; make needed adjustments.

Standard 6: Demonstrate limited slip differential, diagnosis and repair. (1635.S.6)

Limited Slip Differential, Diagnosis and Repair Objectives

Students will:

1635.6.1 Diagnose noise, slippage, and chatter problems; determine needed repairs.

1635.6.2 Inspect and flush differential housing; refill with correct lubricant.

1635.6.3 Inspect and reinstall clutch (cone or plate) components.

1635.6.4 Measure rotating torque; determine needed repairs.

Standard 7: Perform diagnosis and repair of axle shafts. (1635.S.7)

Perform Diagnosis and Repair of Axle Shafts Objectives

Students will:

1635.7.1 Diagnose rear axle shafts, bearings, and seals for noise, vibration, and fluid leakage problems; determine needed repairs.

1635.7.2 Remove and replace rear axle shafts. Inspect and replace rear axle shaft wheel studs.

1635.7.3 Inspect, measure rear axle flange runout and shaft end play and replace rear axle shaft seals, bearings, and retainers.

Standard 8: Perform four-wheel drive/all wheel drive component diagnosis and repair. (1635.S.8)

Four-Wheel Drive/All Wheel Drive Component Diagnosis and Repair Objectives
Students will:
1635.8.1 Diagnose noise, vibration, and unusual steering problems; determine needed repairs.
1635.8.2 Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.
1635.8.3 Remove, disassemble, service, and reassemble transfer case and components and reinstall transfer case.
1635.8.4 Inspect, service, and replace front-wheel bearings and locking hubs.
1635.8.5 Inspect viscous coupling assembly. Check drive assembly seals and vents; check lube level.

Standard 9: Demonstrate automatic transmission/transaxle diagnosis, maintenance and adjustment. (1635.S.9)

Automatic Transmission/Transaxle Diagnosis, Maintenance and Adjustment Objectives
Students will:
1635.9.1 Interpret and verify drivers complaint, diagnose noise and vibrations problems, verify proper engine operation, diagnose unusual fluid usage, level, and condition problems.
1635.9.2 Perform stall tests, perform lock-up converter system tests and determine needed repairs.
1635.9.3 Diagnose electronic, mechanical, and vacuum control systems; determine needed repairs.
1635.9.4 Inspect, adjust, or replace manual shift valve and throttle (TV) linkages or cables and check gear select indicator (as applicable).
1635.9.5 Inspect, repair, and replace governor assembly.
1635.9.6 Inspect, measure, clean, and replace valve body (includes surfaces and bores, springs, valves, sleeves, retainers, brackets, check-ball, screens, spacers, and gaskets); check/adjust valve body bolt torque.
1635.9.7 Inspect servo bore, piston, seals, pin, spring, and retainers; repair or replace as needed.
1635.9.8 Inspect accumulator bore, piston, seals, spring, and retainer; repair or replace as needed.
1635.9.9 Inspect, test, adjust, repair or replace transmission related electrical and electronic components (includes computers, solenoids, sensors, relays, switches, and harnesses).
1635.9.10 Inspect, replace, align power train mounts.
1635.9.11 Inspect and replace parking brake shaft, spring, and retainer.
1635.9.12 Remove and reinstall transmission and torque converter (rear-wheel drive).
1635.9.13 Remove and reinstall transaxle and torque converter assembly.
1635.9.14 Disassemble, clean, and inspect and reassemble transmission/transaxle.

Standard 10: Perform oil pump and converter diagnosis and repair. (1635.S.10)

Oil Pump and Converter Diagnosis and Repair Objectives
Students will:
1635.10.1 Inspect converter flex plate, attaching parts, pilot and pump drive, and seal areas.
1635.10.2 Measure torque converter end play and check for interference; check stator clutch.
1635.10.3 Inspect, measure, and replace oil pump housings, shafts, vanes, rotors, gears, valves, seals, and bushings.
1635.10.4 Check torque converter and transmission cooling system for contamination.

Standard 11: Inspect and repair gear train, shafts, bushings and case. (1635.S.11)

Gear Train, Shafts, Bushings and Case Objectives
Students will:

1635.11.1 Check end play or preload, inspect, measure, and replace thrust washers and bearings.
1635.11.2 Inspect bushings, oil delivery seal rings, ring grooves, and sealing surface areas; replace as needed.
1635.11.3 Inspect and measure planetary gear assembly (includes sun, ring gear, thrust washers, planetary gears, and carrier assembly); replace as needed.
1635.11.4 Inspect cases, bores, passages, bushings, vents, and mating surfaces; replace as needed.
1635.11.5 Inspect, measure, repair, adjust or replace transaxle final drive components.
1635.11.6 Inspect and reinstall parking pawl, shaft, spring, and retainer; replace as needed.

Standard 12: Perform diagnosis and repair of friction and reaction units. (1635.S.12)

Friction and Reaction Units Objectives
Students will:
1635.12.1 Inspect clutch drum, piston, check-balls, springs, retainers, seals, and friction and pressure plates, clutch pack clearance, and inspect bands and drums; replace as needed.
1635.12.2 Air test operation of clutch and servo assemblies.
1635.12.3 Inspect roller and sprag clutch, races, rollers, sprags, springs, cages, and retainers; replace as needed.

Suspension and Steering Diagnosis

This course will introduce students to the basic fundamental skills, technology, and service of automotive suspension and steering systems.

Standard 1: Perform steering systems diagnosis and repair. (1637.S.1)

Steering Systems Diagnosis and Repair Objectives

Students will:

1637.1.1 Disable supplemental restraint system (SRS) in accordance with manufacturer's procedures.

1637.1.2 Diagnose steering column noises, looseness, and binding problems (including tilt mechanisms); determine needed repairs.

1637.1.3 Diagnose power rack and pinion and non-rack and pinion steering gear binding, uneven turning effort, looseness, hard steering, steering gear vibration, and fluid leakage problems: determine needed repairs.

1637.1.4 Inspect and replace steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel.

1637.1.5 Adjust manual or power non-rack and pinion worm gear bearing pre-load and sector lash.

1637.1.6 Remove and replace manual or power rack and pinion steering gear; inspect mounting bushings and brackets.

1637.1.7 Disassemble, inspect, repair, and reassemble rack and pinion steering gear.

1637.1.8 Adjust manual or power rack and pinion steering gear.

1637.1.9 Inspect and replace manual or power rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.

1637.1.10 Inspect manual and power steering fluid levels and condition. Flush, fill, and bleed power steering system. Inspect, replace, and adjust power steering pump belt.

1637.1.11 Diagnose power steering fluid leakage; determine needed repairs.

1637.1.12 Remove, inspect, and replace power steering pump, pump mounts, pump seals, and gaskets. Remove, inspect, and replace power steering pump pulley and check alignment.

1637.1.13 Perform power steering system pressure test; determine needed repairs. Inspect and replace power steering hoses and fittings.

1637.1.14 Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper. Inspect, replace, and adjust tie ends (sockets), tie rod sleeves, and clamps.

1637.1.15 Diagnose, inspect, adjust, repair or replace components of electronically-controlled steering systems.

1637.1.16 Diagnose, inspect, repair or replace components of variable-assist steering systems.

Standard 2: Perform diagnosis and repair of front suspensions. (1637.S.2)

Diagnosis and Repair of Front Suspensions Objectives

Students will:

1637.2.1 Diagnose short and long arm suspension system noises, body sway, and uneven riding height problems; determine needed repairs.

1637.2.2 Diagnose MacPherson strut suspension system noises, body sway, and uneven riding height problems; determine needed repairs. Remove, inspect, and replace ball joints on strut suspension systems.

1637.2.3 Remove, inspect, and replace MacPherson strut cartridge or assembly, strut coil spring, insulators, and upper strut bearing mount.

1637.2.4 Remove, inspect, replace upper and lower control arms, bushings, shafts, and rebound bumpers. Remove, inspect, and replace steering knuckle assemblies.

1637.2.5 Remove, inspect, replace and adjust strut (compression/tension) rods and bushings.

1637.2.6 Remove, inspect, and replace upper and lower ball joints on short and long arm suspension

systems.

1637.2.7 Remove, inspect, and replace short and long arm suspension system coil springs and spring insulators.

1637.2.8 Remove, inspect, replace, and adjust suspension system torsion bars; inspect mounts.

1637.2.9 Remove, inspect, and replace stabilizer bar bushings, brackets, and links.

1637.2.10 Lubricate suspension and steering systems.

Standard 3: Perform diagnosis and repair of rear suspensions. (1637.S.3)

Rear Suspensions Objectives

Students will:

1637.3.1 Remove, inspect, and replace coil springs and spring insulators.

1637.3.2 Remove, inspect and replace transverse links, control arms, bushings, and mounts.

1637.3.3 Remove, inspect, and replace leaf springs, leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.

1637.3.4 Remove, inspect, and replace MacPherson strut cartridge or assembly, strut coil spring, and insulators (silencers).

Standard 4: Demonstrate miscellaneous services. (1637.S.4)

Miscellaneous Services Objectives

Students will:

1637.4.1 Inspect, remove, and replace shock absorbers.

1637.4.2 Remove, inspect, and service or replace front and rear wheel bearings.

1637.4.3 Diagnose, inspect, adjust, repair or replace components of electronically-controlled suspension systems.

Standard 5: Perform diagnosis and adjust wheel alignment. (1637.S.5)

Wheel Alignment Objectives

Students will:

1637.5.1 Diagnose vehicle wander, drift, pull, hard steering, bump steer, ride height, memory steer, torque steer, and steering return problems; determine needed repairs.

1637.5.2 Check and adjust front and rear wheel camber, caster, toe, SAI (steering axis inclination) and determine needed repairs.

1637.5.3 Center steering wheel.

1637.5.4 Check rear wheel thrust angle; determine needed repairs.

1637.5.5 Check for front wheel setback; determine needed repairs.

1637.5.6 Check front cradle (sub-frame) alignment; determine needed repairs.

Standard 6: Perform diagnosis and repair of wheels and tires. (1637.S.6)

Wheels and Tires Objectives

Students will:

1637.6.1 Inspect tires; check and adjust air pressure. Diagnose tire wear patters and determine needed repairs. Rotate tires according to manufacturer's recommendations.

1637.6.2 Diagnose wheel/tire vibrations, shimmy, and noise problems; determine needed repairs.

1637.6.3 Measure wheel, tire, axle, and hub run-out; determine needed repairs.

1637.6.4 Diagnose tire pull (lead) problem; determine corrective actions.

1637.6.5 Dismount, inspect, repair, and remount tire on wheel. Balance wheel and tire assembly (static and dynamic). Reinstall wheel; torque lug nuts.

Cabling-Video/Data/Voice

This course will introduce students to the fundamentals of telecommunications, cabling installation, standards, codes, plans and specifications.

Standard 1: Demonstrate knowledge of cabling installation overview. (1641.S.1)

Cabling Installation Overview Objectives
Students will:
1641.1.1 Describe the history and future directions of the cabling industry.
1641.1.2 Describe the knowledge and skills covered in the training.
1641.1.3 Register for the required examinations for the training.

Standard 2: Describe general information related to cabling. (1641.S.2)

Cabling Objectives
Students will:
1641.1.1 Identify structured premise cabling system characteristics.
1641.1.2 Specify standards and codes.
1641.1.3 Read plans and specifications.
1641.1.4 Understand various cabling media.
1641.1.5 Use various types of connectors.
1641.1.6 Apply transmission fundamentals.
1641.1.7 Properly do grounding and bonding.
1641.1.8 Use the accepted safety standards and procedures.
1641.1.9 Work as a professional in the cabling industry.

Standard 3: Utilize the proper cable installation practices. (1641.S.3)

Cable Installation Practices Objectives
Students will:
1641.1.1 Apply pre-cabling preparation practices.
1641.1.2 Perform cable pulling operations.
1641.1.3 Install the necessary firestopping systems.
1641.1.4 Apply cable termination functions.
1641.1.5 Perform cable splicing procedures.
1641.1.6 Properly perform cable testing procedures.
1641.1.7 Be able to troubleshoot cable problems.
1641.1.8 Perform retrofitting procedures.
1641.1.9 Perform administrative tasks associated with cabling practices.

Fundamentals of UNIX

WVEIS Code 1643

Content Standards for this course are under development.

Networking Fundamentals

This is the first of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. Instruction and training are provided in the proper care, maintenance, and use of networking software, tools, and equipment. Students will also be made aware of safety, building and environmental codes and regulations.

Standard 1: Demonstrate the proper care, maintenance and use of networking software, tools and equipment. (1645.S.1)

Networking Software, Tools and Equipment Objectives

Students will:

1645.1.1 Apply safety rules, regulations, and procedures.
1645.1.2 Utilize decision-making techniques and employ higher-level thinking skills.
1645.1.3 Demonstrate an understanding of the OSI model and its seven layers.
1645.1.4 Demonstrate an understanding of IP addressing schemes.
1645.1.5 Define and demonstrate an understanding of the concept of routers.
1645.1.6 Display an understanding of the application of the binary number system.
1645.1.7 Understand the use of ARP/RARP with routers.
1645.1.8 Discuss the problems and capabilities with various types of media.
1645.1.9 Identify and describe the appropriate IEEE standards for Ethernet and Token Ring
1645.1.10 Design a LAN in the lab setting.
1645.1.11 Describe the design of three types of topologies.
1645.1.12 Make a connection between network media and telecommunications outlets.
1645.1.13 Successfully string cable using approved methods.
1645.1.14 Properly use a cable stretcher for selected tests on the wire.
1645.1.15 Apply EIA/TIA standards to MDF's and IDF's.
1645.1.16 Define and select solutions for: surge, spike, sag, oscillation and ground loop.
1645.1.17 Apply SCAN skills to the workplace.

Project Based Networking

This is the fourth of four courses designed to introduce new content and extend previously learned networking skills. Project Based Networking introduces Wide Area Networks (WAN's), Integrated Services Data Networks (ISDN), Point-to-Point Protocols (PPP) and Frame Relay design, configuration, and maintenance. The culmination of the course is the Threaded Case Study, in which the student designs a WAN utilizing all the knowledge gained in the previous Cisco Courses.

Standard 1: Demonstrate the ability to use Wide Area Networks, Integrated Services Data Networks, Point-to-Point Protocols and Frame Relay design, configuration and maintenance. (1647.S.1)

Wide Area Networks, Integrated Services Data Networks, Point-to-Point Protocols and Frame Relay Design, Configuration and Maintenance Objectives

The student will:

1647.1.1 Understand the basics of WAN technologies.
1647.1.2 Study WAN encapsulation formats, protocols, HDLC, PPP.
1647.1.3 Become aware of the process for gathering data to implement a WAN.
1647.1.4 Describe the placement of Integrated Services Data Network and Frame Relay
1647.1.5 Describe PPP's connection negotiation process
1647.1.6 Understand the use of Link Control Protocol and Network Control Protocol.
1647.1.7 Configure and verify a PPP connection.
1647.1.8 Be able to explain why ISDN is used.
1647.1.9 Apply the standards of ISDN.
1647.1.10 Configure an ISDN connection.
1647.1.11 Understand the services and standards of Frame Relay.
1647.1.12 Understand the functions of DLCI in Frame Relay.
1647.1.13 Explain how Frame Relay solves the problem of split horizon.
1647.1.14 Configure Frame Relay.
1647.1.15 Utilize knowledge gained in the Threaded Case Study.

Routing and Switching

This is the third of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. In this course students will learn about switches, Local Area Networks (LAN's), and Virtual Local Area Networks (VLAN's) design, configuration and maintenance.

Standard 1: Demonstrate knowledge, design, configuration and maintenance of switches, Local Area Networks and Virtual Local Area Networks. (1649.S.1)

Local Area Networks and Virtual Local Area Networks Objectives
Students will:

1649.1.1 Explain The Concept Of Congestion In Switched Ethernet LAN's.
1649.1.2 Design A Plan That Improves LAN Performance Through The Use Of Switches.
1649.1.3 Differentiate Between Symmetric And Asymmetric Switching.
1649.1.4 Define And Explain The Functions Of A VLAN.
1649.1.5 Setup A VLAN By Configuring The Switch.
1649.1.6 Explain The Operation Of VLAN Network Security.
1649.1.7 List And Summarize The IEEE 802 VLAN Standards.
1649.1.8 Define The LAN Design Goals.
1649.1.9 Design A LAN And Justify The Decisions Made On Selected Criteria.
1649.1.10 Demonstrate IGRP Configuration Tasks.
1649.1.11 Compare And Contrast Routing Versus Routed Protocols.
1649.1.12 Compare: Distance Vector, Hybrid, And Link State Routing Protocols.
1649.1.13 Differentiate Between Static Routes, Default Routes And Dynamic Routes.
1649.1.14 Describe The Purpose Of Standard Access Lists And Extended Access Lists.
1649.1.15 Create A List Of Deny/Permit Test.
1649.1.16 Create An IP Access List Using: Wildcard Mask Bits, Wildcard Any & Host.
1649.1.17 Discuss The Difference Between Novell IPX And Other Networks.
1649.1.18 Configure A Novell Network Using Novell IPX Addresses.

Routing Theory and Router Technologies

This is the second of four courses designed to provide students with classroom and laboratory experience in the computer-networking field. This course will focus on the role of the router in networks. Students will study routing protocols, router configuration and various router commands.

Standard 1: Perform routing protocols, router configuration and various router commands. (1651.S1)

Routing Protocols, Router Configuration and Various Router Commands Objectives
Students will:

1651.1.1 Identify the functions of the TCP/IP transport-layer Protocols.
1651.1.2 Manage the configuration files from the privileged exec mode on a router.
1651.1.3 Identify the functions performed by ICMP.
1651.1.4 Control router passwords, identification and enable banners.
1651.1.5 Identify the main Cisco IOS software commands for router startup.
1651.1.6 Check an initial configuration using the setup command.
1651.1.7 Log into a router in both user and privileged modes.
1651.1.8 Be able to use the context-sensitive help facility on the router.
1651.1.9 Use command history and editing features.
1651.1.10 List the commands to load Cisco IOS software from flash memory or ROM.
1651.1.11 Prepare to load, upgrade and load a Cisco IOS software image.
1651.1.12 Identify the parts in a specific protocol address.
1651.1.13 Become aware of problems encountered with topology changes.
1651.1.14 Configure IP addresses and subnet masks.
1651.1.15 Prepare the initial configuration for a router and enable IP.
1651.1.16 Add the RIP routing protocol to the router configuration.
1651.1.17 Add the IGRP routing protocol to the router
1651.1.18 Configure standard access lists to filter IP traffic.
1651.1.19 Configure extended access lists to filter IP traffic.

Web Course Design

This course will teach students to use the web design elements of a professional web page software package as well as various software programs that support that package.

Standard 1: Use the CISCO fundamentals of web design. (1653.S.1)

CISCO Fundamentals of Web Design Objectives
Students will:

1653.1.1 Demonstrate an understanding of the basic design principles for a web page.
1653.1.2 Demonstrate an understanding of file formats related to creating web pages.
1653.1.3 Create basic HTML code using a text editor.
1653.1.4 Create a personal web page in HTML code using a text editor.
1653.1.5 Use an HTML editor to create and edit HTML code.
1653.1.6 Create and edit images for web pages using digital cameras and various photography and graphic software programs.
1653.1.7 Optimize images for the web.
1653.1.8 Create vector and bitmap graphics.
1653.1.9 Create .SWF and .GIF animations.
1653.1.10 Create animations with DHTML.
1653.1.11 Create navigational elements.
1653.1.12 Edit and optimize video for web delivery.
1653.1.13 Create web pages with interactive elements.
1653.1.14 Demonstrate the use of accessibility.
1653.1.15 Demonstrate the use of usability.
1653.1.16 Create and use tables, hyperlinks, and frames.
1653.1.17 Create and use Cascading Style Sheets.
1653.1.18 Demonstrate site management skills.
1653.1.19 Create a website for the course project.

Standard 2: Use ethics in web page design. (1653.S.2)

Web Page Design Objective
Students will:

1653.2.1 Practice ethic behavior when developing and using web pages and the Internet.

Blueprint Reading

This course will introduce students to basic blueprint reading fundamentals, including symbols, orthographic projections, isometric and sketching techniques, dimensioning, title blocks and common practices.

Standard 1: Determine requirements from construction drawings and floor plans, draw office and field sketches and identify and interpret basic civil, mapping and architecture symbols. (1661.S.1)

Construction Drawings and Floor Plans Objectives

Students will:

1661.1.1 Identify alphabet of lines and mapping symbols.
1661.1.2 Describe location of six (6) most commonly used views with orthographic projections.
1661.1.3 Demonstrate isometric and plane view sketching techniques.
1661.1.4 Complete statements concerning methods of dimensioning.
1661.1.5 Differentiate between notes and specifications.
1661.1.6 Analyze information from plan views and title blocks.
1661.1.7 Explain function and use of typical drawings.
1661.1.8 Read a drawing and write a bill of materials.
1661.1.9 Draw working sketches using field notes, dimensions and specifications.
1661.1.10 Identify drawing symbols and draw samples of each.
1661.1.11 Describe common blueprint abbreviations.
1661.1.12 Interpret abbreviations for common construction practices.
1661.1.13 Use print machine to make working copies of original drawings.

Fundamentals of Collision Repair Technology

This course will introduce students to the basic fundamentals of Collision Repair Technology. Students will become familiar with tools and materials for basic analysis and damage repair; general occupational information and computer applications.

Standard 1: Identify, explore, and evaluate career opportunities related to automotive technology. (1671.S.1)

Automotive Technology Objectives
Students will:

1671.1.1 Describe a variety of careers related to automotive technology, and the training necessary to be successful in those careers.
1671.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of automotive technology.
1671.1.3 Identify sources of information about careers in automotive technology.

Standard 2: Demonstrate knowledge of basic safety rules, equipment and hazardous waste disposal as it relates to collision repair technology. (1671.S.2)

Collision Repair Technology Objectives
Students will:

1671.2.1 Recognize and follow general collision repair lab safety guidelines, including the wearing of appropriate protective equipment.
1671.2.2 Demonstrate the proper selection and use of fire extinguishers.
1671.2.3 Identify personal health and safety hazards according to OSHA guidelines.
1671.2.4 Identify and properly dispose of hazardous waste according to EPA regulations.
1671.2.5 Inspect air makeup and exhaust systems to insure proper filtering and ventilation. (intake filters, exhaust filters, fan, and other mechanical components of the system).
1671.2.6 Select spray mask and inspect to insure proper fit and operation; inspect condition of the mask filters and other components.

Standard 3: Analyze damage and prepare a vehicle for repairs. (1671.S.3)

Vehicle Repair Objectives
Students will:

1671.3.1 Review damage report, and analyze damage to determine appropriate methods for overall repair.
1671.3.2 Remove damaged or necessary inside and outside trim and moldings.
1671.3.3 Remove damaged, non-structural body panels and components that may interfere with or be damaged during repair.
1671.3.4 Remove all vehicles mechanical and electrical components that may interfere with or be damaged during repair; replace after repair.
1671.3.5 Protect panels and parts adjacent to repair area to prevent damage.
1671.3.6 Remove dirt, grease, and wax from those areas to be repaired.
1671.3.7 Remove dirt, corrosion protection, under coatings, sealers, and other protective coatings necessary to perform repairs to structural areas.
1671.3.8 Remove repairable plastics and other parts that are recommended for off-car repair.

Standard 4: Metal finish a damaged panel to its original form. (1671.S.4)

Metal Finish Objectives
Students will:

1671.4.1 Grind the paint from the damaged area of body panel.
1671.4.2 Pick and file the damaged area of a body panel to eliminate surface irregularities.
1671.4.3 Disc sand the repaired body panel to produce final smoothness.

Standard 5: Mix and apply body fillers. (1671.S.5)

Body Filler Objectives
Students will:
1671.5.1 Mix and apply plastic body filler and cheese-grate during curing.
1671.5.2 Rough sand cured plastic body filler to contour; finish sand.
1671.5.3 Featheredge repaired areas.

Standard 6: Inspect, adjust, repair, or replace moveable glass and hardware. (1671.S.6)

Glass and Hardware Objectives
Students will:
1671.6.1 Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
1671.6.2 Repair or replace all power-driven accessories and related controls (including electrically-heated glass).
1671.6.3 Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair and replace weather stripping.
1671.6.4 Inspect, repair or replace, and adjust removable, manually-operated, roof panel, and hinges, latches, guides handles, retainer, and controls of sun roofs.

Mechanical and Electrical Components

This course will introduce students to the entry-level skills necessary in mechanical and electrical repairs as they apply to collision repair technology.

Standard 1: Inspect and service supplemental airbag restraint systems. (1673.S.1)

Airbag Restraint System Objectives
Students will:
1673.1.1 Disarm airbag system in accordance with manufacturer's procedures.
1673.1.2 Inspect and replace damaged sensors and wiring in accordance with manufacturer's procedures; insure proper sensor orientation.
1673.1.3 Verify that system is armed and operational in accordance with manufacturer's procedures.
1673.1.4 Remove and replace non-deployed airbag; observe manufacturer's safety procedures.
1673.1.5 Use fault codes to diagnose and repair airbag system.

Standard 2: Inspect and service passive restraint systems.

Passive Restraint System Objectives
Students will:
1673.2.1 Remove and replace seatbelt and shoulder harness assembly in accordance with manufacturer's procedures.
1673.2.2 Inspect anchorages for deformation; repair as required.
1673.2.3 Verify proper operation of seatbelt in accordance with manufacturer's procedures.
1673.2.4 Remove and replace track and drive assembly, lap retractor, torso retractor assembly, inboard buckle-lap retractor, knee blocker, etc.

Standard 3: Service active restraint systems. (1673.S.3)

Active Restraint System Objectives
Students will:
1673.3.1 Remove and replace seatbelt and shoulder harness assembly in accordance with manufacturer's procedures.
1673.3.2 Inspect anchorage for deformation; repair as required.

Standard 4: Identify, inspect, and repair suspension and steering systems. (1673.S.4)

Repair Suspension and Steering Systems Objectives
Students will:
1673.4.1 Inspect and replace rack and pinion steering gear, inner tie rod ends (sockets), and bellows boots.
1673.4.2 Remove and replace power steering gear (non-rack and pinion type).
1673.4.3 Remove and replace power steering pump; inspect pump mounts.
1673.4.4 Remove, replace, and adjust tie rods, tie rod sleeves, clamps, and tie rod ends (sockets).
1673.4.5 Remove and replace strut rods and bushings on long and short arm suspension systems.
1673.4.6 Remove and replace upper and lower ball joints on short and long arm suspension systems.
1673.4.7 Remove and replace steering knuckle/spindle assemblies.
1673.4.8 Remove and replace front and rear suspension components.
1673.4.9 Remove and replace shock absorbers.
1673.4.10 Diagnose vehicle wandering, pulling hard steering, bump steering, memory steering, torque steering, and steering return problems; determine needed repairs.
1673.4.11 Check and adjust caster on suspension systems with a caster adjustments.

1673.4.12 Measure vehicle ride height; determine needed repairs.
1673.4.13 Center steering wheel.
1673.4.14 Diagnose tire wear patterns; determine needed repairs.

Standard 5: Inspect and service air conditioning systems. (1673.S.5)

Air Conditioning System Objectives
Students will:
1673.5.1 Inspect, repair and replace air conditioner system hoses, lines, fittings, and related components (compressor, condenser, evaporator).
1673.5.2 Recharge air conditioner according to manufacturer's recommendations.

Standard 6: Inspect, adjust, and repair hydraulic brake systems. (1673.S.6)

Hydraulic Brake System Objectives
Students will:
1673.6.1 Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, and supports.
1673.6.2 Inspect flexible brake hoses for leaks, kinks, cracks, bulging, or wear; tighten loose fittings and supports.
1673.6.3 Select, handle, store, and install brake fluids, (including silicone fluids).
1673.6.4 Bleed (manual, pressure, vacuum, or surge) and/or flush hydraulic brake system, in accordance with manufacturer's procedures.
1673.6.5 Pressure test brake hydraulic system by applying heavy force to pedal, hold for 15 seconds and inspect for leaks.
1673.6.6 Adjust brake shoes and reinstall brake drums or drum/hub assemblies and wheel 1673. bearings.
1673.6.7 Reinstall wheel, torque lug nuts, and make final checks for adjustments.
1673.6.8 Remove and replace caliper assembly.
1673.6.9 Clean and inspect; caliper mountings and slides for wear and damage.
1673.6.10 Check parking brake system operation.

Standard 7: Inspect and service cooling systems. (1673.S.7)

Cooling Systems Objectives
Students will:
1673.7.1 Inspect and replace engine cooling system hoses and belts.
1673.7.2 Drain, flush and refill system with proper coolant and level or protection.
1673.7.3 Inspect, remove and replace radiator, pressure cap, coolant recovery system, and water pump.
1673.7.4 Remove and replace fan, fan clutch (both electrical and mechanical), and fan shroud.

Standard 8: Analyze, repair, and replace electrical components. (1673.S.8)

Electrical Components Objectives
Students will:
1673.8.1 Check voltages in electrical wiring circuits with a voltmeter; determine needed repairs.
1673.8.2 Check continuity and resistance in electrical wiring circuits and components with an ohmmeter; determine needed repairs.
1673.8.3 Check electrical wiring circuits with jumper wires; determine needed repairs.
1673.8.4 Inspect, test, and replace fusible links, circuit breakers, and fuses.
1673.8.5 Perform battery state-of-charge in accordance with manufacturers recommendations.
1673.8.6 Identify programmable electrical/electronic components; record data from reprogramming before disconnecting battery.

1673.8.7 Inspect, clean, and repair or replace battery cables, connectors, and clamps.
1673.8.8 Inspect, adjust, and replace alternator drive belts, pulleys, and fans.
1673.8.9 Remove and replace alternator.
1673.8.10 Remove and replace headlights, parking/taillights, stop lights, flashers, turn-signals and backup lights; check operation.
1673.8.11 Inspect, replace, and aim headlights/bulbs.
1673.8.12 Check operation of retractable headlight assembly.
1673.8.13 Remove and replace motors, switches, relays, connectors, and wires of retractable headlight assembly circuits.
1673.8.14 Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and wires of all light circuits including four-wire taillight systems.

Non-Structural Analysis And Damage Repair

This course will introduce students to the entry-level skills necessary in non-structural analysis and repair of metal and composite parts.

Standard 1: Determine the extent of damage, plan method, and make outer body panel repairs, replacement and adjustments. (1675.S.1)

Outer Body Panel Repair Objectives
Students will:

1675.1.1 Determine the extent of the direct and indirect damage, the direction of impact, and plan the methods and order of repair.
1675.1.2 Determine the extent of damage to aluminum body panels; repair; weld or replace in accordance with manufacturer's specifications.
1675.1.3 Remove, replace and align hood, hood hinges, and hood latch.
1675.1.4 Remove, replace and align deck lid, lid hinges, and lid latch.
1675.1.5 Remove and replace doors, tailgates, hatches, lift gates, latches assemblies and hinges.
1675.1.6 Remove, replace and align bumpers, reinforcements, guards, isolators, and mounting hardware.
1675.1.7 Check and adjust clearances of front fenders, headers, and other panels.
1675.1.8 Check door hinge condition; check door frames for proper fit; check and adjust door clearances (where adjustable) along quarter panel, door, rocker panel, fender, and top.
1675.1.9 Repair or replace door skins and intrusion beams in accordance with vehicle manufacturer's specification.
1675.1.10 Straighten roughed out contours of damaged panel to a surface condition for body filling or metal finishing using power and hand tools.
1675.1.11 Weld cracked or torn steel body panels; re-weld broken welds.
1675.1.12 Heat shrink stretched panel areas back to contour, and restore contour with heat.
1675.1.13 Cold shrink stretched panel areas back to cover, and apply protective coatings and sealants.

Standard 2: Identify and repair various types of automotive plastics. (1675.S.2)

Automotive Plastics Objectives
Students will:

1675.2.1 Identify types of plastics to be repaired and their repair procedures.
1675.2.2 Repair rigid and flexible plastic parts with urethane or epoxy adhesives and fiberglass reinforcements according to vehicle and industry specifications.
1675.2.3 Remove damaged areas from rigid exterior sheet molded compound (SMC) panels and repair with partial panel installation.
1675.2.4 Retexture and refinish interior plastic parts.
1675.2.5 Repair vinyl-clad urethane foam parts.
1675.2.6 Reshape and shrink flexible exterior plastic parts.

Structural Analysis and Damage Repair

This course will introduce students to the entry-level skills necessary in structural analysis and repair of frame and unibody type vehicles using welding techniques, measuring equipment and frame machines.

Standard 1: Identify weld types, joints, welder setup and analyze weld defects. (1677.S.1)

Weld Objectives
Students will:

1677.1.1 Identify weldable and non-weldable materials used in autobody components.
1677.1.2 Determine correct electrode wire type, diameter and gas to be used in specific welding situations.
1677.1.3 Determine the correct type of weld and weld joint (continuous, stitch/pulse, tack, plug, etc,) for each specific weld repair.
1677.1.4 Identify safety considerations: eye protection, proper clothing, shock hazards, dangerous fumes, etc. before beginning welding operation.
1677.1.5 Set up and tune the welder in accordance with manufacturers' instructions; clean the gun and gas nozzle as required.
1677.1.6 Protect computers and other electronic modules from possible welding damage.
1677.1.7 Clean the metal to be welded; assure good metal fit through preparation and clamping.
1677.1.8 Use the proper angle of the gun to the joint, and the direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
1677.1.9 Identify cause(s) of splits and sputters, burn through, lack of penetration, cracks in metal, porosity, incomplete fusion, excessive spatter, distortion, and waviness of bead; make necessary adjustments.
1677.1.10 Identify cause(s) of contact tip burn-back and failure of wire to feed; make necessary adjustments.

Standard 2: Diagnose, measure and repair unibody and framed damage. (1677.S.2)

Unibody and Framed Damage Objectives
Students will:

1677.2.1 Diagnose and measure structural damage using tram and centering gauges according to manufacturer's specifications.
1677.2.2 Diagnose and measure unibody damage using a dedicated (fixture) or universal measuring system compared to specification.
1677.2.3 Attach body anchoring devices.
1677.2.4 Straighten and align all types of frame damage on a typical frame type vehicle (mash, sag, sideway, twist, kickup, diamond).
1677.2.5 Straighten and align structural panels on unibody type vehicles (roof, cowl, pillars, rockers, front and rear sections).
1677.2.6 Apply cold and heat stress relief methods and weld in accordance with vehicle manufacturer's recommendations.
1677.2.7 Remove and replace damaged frame horns, side rails, cross members and structural steel body panels in accordance with vehicle manufacturers recommendation/industry standards.
1677.2.8 Perform structural panel sectioning in accordance with vehicle manufacturers specifications/ industry standards.
1677.2.9 Restore corrosion protection to repaired structural areas in accordance with vehicle manufacturers specifications.

Standard 3: Remove and replace fixed glass using manufacturers procedures. (1677.S.3)

Fixed Glass Objectives

Students will:

1677.3.1 Remove and replace fixed glass (heated and non-heated) and modular glass using manufacturers procedures.

1677.3.2 Remove and replace butyl-retained and urethane-retained modular glass with mechanical fasteners.

1677.3.3 Determine when to use the partial cutout or the full cutout method of repair when replacing a windshield.

Surface Preparation and Refinishing

This course will introduce students to the entry-level skills necessary in the surface preparation and refinishing of vehicles using various refinishing systems.

Standard 1: Prepare a surface for refinishing using proper safety precautions. (1679.S.1)

Surface Safety Precautions Objectives
Students will:

1679.1.1 Remove and store trim and molding.
1679.1.2 Remove dirt, wax, road grime, and special coatings from area to be refinished. and from adjacent surfaces; wash entire vehicle.
1679.1.3 Inspect and identify type of finish and surface condition; develop a plan for refinishing.
1679.1.4 Chemically and mechanically remove paint finish where necessary.
1679.1.5 Featheredge and wet sand area to be refinished.
1679.1.6 Identify type of metal and apply suitable metal treatments.
1679.1.7 Mask trim and other areas that will not be refinished.
1679.1.8 Mix primer, primer-surface, or primer-sealer; spray onto surface of repaired area according to parts manufacturer's specifications.
1679.1.9 Dry or wet block sand areas to which primer-surface has been applied.
1679.1.10 Compound or prepare around the edge of the repaired area to be refinished.
1679.1.11 Blow dust from entire vehicle including cracks and moldings in the area to be refinished.
1679.1.12 Clean area to be refinished with a proper solvent.
1679.1.13 Remove, with a tack rag, any dust or lint particles from the area to be refinished.
1679.1.14 Apply recommended sealer to the area being refinished according to manufacturer's specifications.
1679.1.15 Scuff sand to remove nibs or over spray from a sealer.

Standard 2: Inspect, clean and operate spraying equipment. (1679.S.2)

Spraying Equipment Objectives
Students will:

1679.2.1 Inspect, clean, and determine condition and adequacy of spray guns and related equipment (air hose, regulator, air lines, and compressor).
1679.2.2 Check and adjust air pressure on the spray gun (includes siphon-feed, and gravity-feed).
1679.2.3 Adjust spray gun using fluid and pattern control valves.
1679.2.4 Check and adjust high volume, low pressure spraying equipment.

Standard 3: Mix, match, and apply various refinishing systems. (1679.S.3)

Refinishing Systems Objectives
Students will:

1679.3.1 Determine type and color of paint on vehicle.
1679.3.2 Shake, stir, thin or reduce, or strain paint according to manufacturer's recommendations.
1679.3.3 Select proper air pressure and spraying technique (gun arc, gun angle, gun distance, gun speed, and spay pattern overlap) for finish being applied.
1679.3.4 Apply selected product on test panel in accordance with manufacturers recommendations.
1679.3.5 Apply acrylic enamel, urethane and urethane basecoat/clearcoat for spot and panel blending, and overall refinishing.
1679.3.6 Check for color matching of all applied finishes.
1679.3.7 Select and perform sanding, buffing, and polishing processes for finish.
1679.3.8 Identify the types of rigid and flexible plastic parts to be finished; determine correct materials and refinishing procedures.
1679.3.9 Apply finish coat to rigid and flexible plastic parts.

1679.3.10 Clean, condition, and refinish vinyl (e.g., upholster, dashes, and tops).
1679.3.11 Clean and detail vehicle after complete refinishing.
1679.3.12 Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.

Standard 4: Identify and solve paint application problems and finish defects, and determine cause and cure. (1679.S.4)

Paint Application Objectives
Students will:
1679.4.1 Identify, prevent and correct all paint application problems that occur in refinishing operations.

Fundamentals of Broadcasting (Radio & TV)

This course will introduce students to the basic fundamentals needed to support broadcast managers in the production and broadcasting of materials or programs. Students will become familiar with the equipment, processes, and procedures used in producing and making radio and television broadcasts.

Standard 1: Identify, explore, and evaluate career opportunities related to radio and television production. (1681.S.1)

Radio and Television Production Objectives
Students will:

1681.1.1 Describe a variety of careers related to radio and television production, and the training necessary to be successful in those careers.
1681.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of radio and television production.
1681.1.3 Identify sources of information about careers in radio and television production.
1681.1.4 Describe the effect that computers and automation have and will have on the broadcast Industry.

Standard 2: Identify elements of radio broadcast equipment and procedures. (1681.S.2)

Radio Broadcast Objectives
Students will:

1681.2.1 Identify safety rules for operating radio broadcasting equipment.
1681.2.2 Define uses for electronic equipment (microphones, recorders, etc.) and proper care while operating.
1681.2.3 Demonstrate efficiency and accuracy while performing cue up and playing of records, compact disks, cassettes, open reel tapes and computerized audio files.
1681.2.4 Operate audio console and identify proper modulations levels.

Standard 3: Identify elements of television broadcast equipment and procedures. (1681.S.3)

Television Broadcast Objectives
Students will:

1681.3.1 Identify safety rules for operating television broadcasting equipment.
1681.3.2 Define uses for television broadcasting electronic equipment (microphones, cameras, etc.) and proper care while operating.
1681.3.3 Apply knowledge of camera shots and angles.
1681.3.4 Illustrate proper way to hold scripts and props.
1681.3.5 Identify problems of microphone and camera consciousness, and ways to overcome camera fright.
1681.3.6 Recognize and perform hand signals used in television broadcasting.
1681.3.7 Identify various types of video equipment.
1681.3.8 Demonstrate the ability to make minor repairs to lighting such as replacing defective bulbs, cables and equipment.
1681.3.9 Illustrate proper posture for on-air performance.
1681.3.10 Prepare and demonstrate use of cue cards.
1681.3.11 Select and demonstrate proper use of "hitting marks".

Radio Broadcast Applications

This course will provide students with the knowledge to perform, either in a live or mock setting, a radio broadcast.

Standard 1: Prepare material for on-air presentations. (1683.S.1)

Air Presentations Objectives
Students will:
1683.1.1 Describe FCC rules and regulations relating to radio broadcasting.
1683.1.2 Identify various news services, their differences and how they are used.
1683.1.3 Interpret wire service copy.
1683.1.4 Describe the importance of objectivity in story writing to avoid bias.
1683.1.5 Demonstrate proper conversational and broadcast news style writing skills.
1683.1.6 Read and use various editing techniques to rewrite scripts.
1683.1.7 Follow format clock and time news reports and programs correctly.
1683.1.8 Set up and make entries in an operating log and a program log.
1683.1.9 Write and produce a newscast.

Standard 2: Demonstrate basic skills for delivering on-air productions. (1683.S.2)

Basic Skills On Air Productions Objectives
Students will:
1683.2.1 Identify problems of voice quality and ways to overcome "mike fright".
1683.2.2 Interpret and perform hand signals used in radio broadcasting.
1683.2.3 Speak clearly and in conversational style when delivering a broadcast.
1683.2.4 Read, in an effective manner, copy written by someone else.
1683.2.5 Apply ad-libbing techniques.

Standard 3: Demonstrate advanced skills in radio production. (1683.S.3)

Advanced Skills in Radio Production Objectives
Students will:
1683.3.1 Clean magnetic heads on tape equipment and bulk erase tapes.
1683.3.2 Write a commercial or public service announcement.
1683.3.3 Preview, critique, and select segments for possible airing.
1683.3.4 Determine story priority for a news broadcast.
1683.3.5 Conduct and perform a sports interview, a live interview, and a remote broadcast.
1683.3.6 Prepare and broadcast sports and news commentaries and editorials.
1683.3.7 Design and execute special effects.
1683.3.8 Conduct market research.

Television Production Applications

This course will provide students with an entry-level understanding of the components of television broadcasting.

Standard 1: Operate television broadcast equipment. (1685.S.1)

Operate Television Broadcast Equipment Objectives
Students will:
1685.1.1 Take a level.
1685.1.2 Adjust camera control unit.
1685.1.3 Set up lights for production purposes.
1685.1.4 Operate a switcher, an audio board, a video recorder and a tele-prompter.
1685.1.5 Switch studio lights on during broadcast following script or instructions from director.

Standard 2: Utilize proper television techniques to develop quality productions. (1685.S.2)

Quality Productions Objectives
Students will:
1685.2.1 Use various script formats.
1685.2.2 Set up equipment and conduct a one-person field interview.
1685.2.3 Perform a live interview.
1685.2.4 Assemble a videotape "package" (studio and field types).
1685.2.5 Assign staff personnel to operate and direct broadcasting activities.
1685.2.6 Apply ad-libbing techniques.
1685.2.7 Prepare and broadcast sports, news, commentaries, and editorials.
1685.2.8 Properly apply makeup for television broadcasting.
1685.2.9 Design and construct a set.
1685.2.10 Write and produce a newscast.

Standard 3: Demonstrate television production editing skills. (1685.S.3)

Editing Skills Objectives
Students will:
1685.3.1 Design and use electronic graphics.
1685.3.2 Operate a time base corrector (TBC)
1685.3.3 Perform electronic and manual edits.
1685.3.4 Read, edit and rewrite scripts.
1685.3.5 Time news reports correctly, and edit if necessary.
1685.3.6 Set up and make entries in an operating log and a program log.

Standard 4: Demonstrate television production troubleshooting skills and special techniques. (1685.S.4)

Skills and Special Techniques Objectives
Students will:
1685.4.1 Identify common symptoms of head clogs and tracking problems.
1685.4.2 Apply news judgment to field interviewing.
1685.4.3 Design and perform special effects.
1685.4.4 Prepare an instruction sheet or manual on video taping filed stories (both storyboard and script).

A+ Service Technician

This course will provide the knowledge and skills to identify, configure and upgrade microcomputer modeling and peripherals, safety and preventive maintenance procedures. Also included will be specific terminology, categories and principles of motherboard, procedures and memory in microcomputer systems. Diagnosing and troubleshooting common and system malfunctions and networking concepts will be included.

Standard 1: Perform installation, configurations, and upgrading of computers. (1701.S.1)

Computers Objectives
Students will:

1701.1.1 Identify basic terms, concepts, and functions of system modules, including how each module should work during normal operation and during the boot process.
1701.1.2 Identify basic procedures for adding and removing field replaceable modules for both desktop and portable systems.
1701.1.3 Identify available IRQ's, DMA's, and I/O addresses and procedures for device installation and configuration.
1701.1.4 Identify common peripheral ports, associated cabling, and their connectors.
1701.1.5 Identify proper procedures for installing and configuring IDE/EIDE devices.
1701.1.6 Identify proper procedures for installing and configuring SCSI devices.
1701.1.7 Identify proper procedures for installing and configuring peripheral devices.
1701.1.8 Identify hardware methods of upgrading system performance, procedures for replacing basic subsystem components, unique components and when to use them.

Standard 2: Demonstrate diagnosing and troubleshooting procedures. (1701.S.2)

Procedures Objectives
Students will:

1701.2.1 Identify common symptoms and problems associated with each module and how to troubleshot and isolate the problems.
1701.2.2 Identify basic troubleshooting procedures and how to elicit problem symptoms from customers.

Standard 3: Perform preventative maintenance procedures. (1701.S.3)

Preventative Maintenance Procedures Objectives
Students will:

1701.3.1 Identify common symptoms and problems associated with each module and how to troubleshoot and isolate the problems.
1701.3.2 Identify basic troubleshooting procedures and how to elicit problem symptoms from customers.

Standard 4: Identify the Motherboard/Processors/Memory parts of the computer. (1701.S.4)

Parts of the Computer Objectives
Students will:

1701.4.1 Distinguish between the popular CPU chips in their basic characteristics.
1701.4.2 Identify the categories of RAM (Random Access Memory) terminology, their locations, and physical characteristics.
1701.4.3 Identify the most popular type of motherboards, their components, and their architecture (bus structures and power supplies).
1701.4.4 Identify the purpose of CMOS (Complementary Metal-Oxide Semiconductor), what it contains and how to change its basic parameters.

Standard 5: Demonstrate knowledge of various printers. (1701.S.5)

Printers Objectives
Students will:
1701.5.1 Identify basic concepts, printer operations and printer components.
1701.5.2 Identify care and service techniques and common problems with primary printer types.

Standard 6: Demonstrate basic networking knowledge. (1701.S.6)

Basic Networking Objectives
Students will:
1701.6.1 Identify basic networking concepts, including how a network works and the ramifications of repairs on the network.

Computer Maintenance And Repair

This course will provide students with the necessary skills to detect and correct hardware and software faults in personal computers.

Standard 1: Demonstrate safe practices when working with electronic devices. (1703.S.1)

Safe Practices Objectives
Students will:
1703.1.1 Identify types of computer viruses and the methods of removing and protecting against them.
1703.1.2 Identify and demonstrate proper usage of the components of a basic technician's toolkit.
1703.1.3 Demonstrate proper use of a multimeter.

Standard 2: Identify and define hardware. (1703.S.2)

Hardware Objectives
Students will:
1703.2.1 Demonstrate knowledge of basic systems components.
1703.2.2 Use a block diagram to identify the ALU, control and memory components of the system unit and explain each.
1703.2.3 Describe the differences between RAM and ROM memory.
1703.2.4 Identify and explain the usage of several of the more common input devices.
1703.2.5 Identify several special-purpose output devices.
1703.2.6 Describe the differences between monochrome and color display screens.
1703.2.7 Identify and explain the difference between impact and non impact printers.
1703.2.8 Describe the need for auxiliary storage devices.
1703.2.9 Identify the various types and characteristics of auxiliary storage devices.
1703.2.10 Identify several of the more common magnetic disk devices, explain how they function, and describe how they are used.
1703.2.11 Identify optical storage devices, explain how they function, and describe how they are used.
1703.2.12 Identify magnetic tape devices, explain how they function, and are used.
1703.2.13 Identify and explain the difference between cathode ray tube (CRT) and liquid crystal display (LCD) technology.
1703.2.14 Identify and describe interactive processing and batch processing.

Standard 3: Troubleshoot system components. (1703.S.3)

System Components Objectives
Students will:
1703.3.1 Demonstrate correct system disassembly and reassembly.
1703.3.2 Identify and correct common faults in system unit components.
1703.3.3 Identify and correct common faults in I/O devices.
1703.3.4 Identify and correct common faults in operating system components and drives.
1703.3.5 Identify and correct common faults in applications.
1703.3.6 Utilize operating system components, diagnostic software and supplied documentation to detect and correct faults.
1703.3.7 Understand the proper procedure for contacting technical support services.

Standard 4: Demonstrate proper customer support procedures. (1703.S.4)

Proper Customer Support Objectives
Students will:
1703.4.1 Demonstrate proper telephone and personal etiquette.

1703.4.2 Discuss various questioning techniques.
1703.4.3 Perform after-call follow-up.
1703.4.4 Maintain logs.

Fundamentals of Computer Systems

This course will introduce students to the entry-level job skills related to the computer industry, as well as give them a solid foundation for college study in the computer sciences. Students will become familiar with computer operating systems, operational software, and networking of systems.

Standard 1: Identify, explore, and evaluate career opportunities related to computer systems. (1705.S.1)

Computer Systems Objectives
Students will:

1705.1.1 Describe a variety of careers related to computer systems, and the training necessary to be successful in those careers.
1705.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of computer systems.
1705.1.3 Identify sources of information about careers in computer systems.

Standard 2: Demonstrate a knowledge of information processing. (1705.S.2)

Information Processing Objectives
Students will:

1705.2.1 List the four elements of the information processing cycle and explain the purpose of each.
1705.2.2 Use a block diagram to identify the ALU, control and memory components of the system unit and explain each.
1705.2.3 Describe the difference between RAM and ROM memory.
1705.2.4 Identify and explain the usage of several of the more common input devices, and identify several special-purpose input devices.
1705.2.5 Identify and explain the usage of several of the more common output devices, and identify several special-purpose output devices.
1705.2.6 Identify and explain the difference between impact and non-impact printers.
1705.2.7 Identify the various types and characteristics of auxiliary storage devices, and the need for them.
1705.2.8 Identify several of the more common magnetic disk devices, explain how they function, and describe how they are used.
1705.2.9 Identify optical storage devices, explain how they function, and describe how they are used.
1705.2.10 Identify magnetic tape devices, explain how they function, and describe how they are used.
1705.2.11 Identify various displays available, and explain the difference between cathode ray tube (CRT) and liquid crystal display (LCD) technology.
1705.2.12 Identify and describe interactive processing and batch processing.

Standard 3: Demonstrate a knowledge of trends and issues in the computer industry. (1705.S.3)

Computer Industry Objectives
Students will:

1705.3.1 Discuss the ethical problems facing the computer industry.
1705.3.2 Demonstrate a knowledge of future uses of computer systems, using current literature.

Standard 4: Demonstrate a knowledge of data structure. (1705.S.4)

Data Structure Objectives
Students will:

1705.4.1 List the two most commonly used coding schemes.
1705.4.2 Define bits, bytes, fields, records and files.

Standard 5: Demonstrate a knowledge of data communications. (1705.S.5)

Data Communications Objectives
Students will:
1705.5.1 Describe the basic components of a data communications system.
1705.5.2 Discuss various methods and media of networking.

Standard 6: Utilize and define an operating system. (1705.S.6)

Operating System Objectives
Students will:
1705.6.1 Define the purpose and functions of an operating system.
1705.6.2 Compare and contrast the capabilities of single-user environments and multi-tasking environments.
1705.6.3 Describe some of the issues of operating system compatibility.
1705.6.4 Effectively use an operating system to view directories, format disks, and copy, rename, and delete files.
1705.6.5 Maintain operation logs.

Standard 7: Demonstrate the use of operational software for system troubleshooting. (1705.S.7)

Operational Software Objectives
Students will:
1705.7.1 Perform operator diagnostic troubleshooting on a microcomputer system.
1705.7.2 Correct faults identified by troubleshooting.

Systems Software

This course provides an overview of operating system concepts, the use of personal computer operating systems, data communications, networking concepts and utilization, and an introduction to the Internet.

Standard 1: Demonstrate knowledge of operating system components. (1707.S.1)

Operating System Components Objectives
Students will:
1707.1.1 Define operating system.
1707.1.2 Compare and contrast command-driven, menu-driven and icon-driven operating systems.
1707.1.3 Compare and contrast single-tasking versus multitasking operating system.
1707.1.4 Describe various personal computer operating systems in use today.

Standard 2: Utilize an operating system. (1707.S.2)

Operating System Objectives
Students will:
1707.2.1 Install and configure an operating system.
1707.2.2 Effectively use an operating system to complete a variety of operations.
1707.2.3 Use supplied documentation.

Standard 3: Demonstrate knowledge of data communications. (1707.S.3)

Data Communications Objectives
Students will:
1707.3.1 Define networking, and describe the basic components of a data communications system.
1707.3.2 Describe the difference between local and remote terminals.
1707.3.3 Define a Local Area Network (LAN) and a Wide Area Network (WAN).
1707.3.4 Compare and contrast various transmission methods and media.
1707.3.5 Compare and contrast peer-to-peer, client-server, host-based time sharing, and dedicated file servers.

Standard 4: Utilize a Network Operating System. (1707.S.4)

Network Operating System Objectives
Students will:
1707.4.1 Install and configure NOS on servers and clients.
1707.4.2 Utilize NOS to complete a variety of tasks.

Standard 5: Demonstrate knowledge of the Internet. (1707.S.5)

Knowledge of the Internet Objectives
Students will:
1707.5.1 Define the Internet and discuss its historical evolution.
1707.5.2 Utilize various components of the Internet including WWW, email, news groups, search engines, and FTP facilities.
1707.5.3 Utilize browsers to access www facilities.

Technical Computer Applications

This course will introduce students to the basic principles of computer programming, including program design and implementation. Students will obtain an in-depth understanding of computer software.

Standard 1: Demonstrate knowledge of word processing software. (1709.S.1)

Word Processing Software Objectives
Students will:
1709.1.1 Create a document with proper formatting.
1709.1.2 Modify a document, then print copies.

Standard 2: Demonstrate knowledge of an electronic spreadsheet. (1709.S.2)

Electronic Spreadsheet Objectives
Students will:
1709.2.1 Create, save and print a copy of a basic worksheet.
1709.2.2 Modify an existing worksheet.
1709.2.3 Create a worksheet graph.

Standard 3: Demonstrate knowledge of computer graphics. (1709.S.3)

Computer Graphics Objectives
Students will:
1709.3.1 Define computer graphics and list three uses of graphics software.
1709.3.2 Create a graphic with graphics software.

Standard 4: Demonstrate knowledge of presentation software. (1709.S.4)

Presentation Software Objectives
Students will:
1709.4.1 Plan and create a presentation using presentation software.
1709.4.2 Deliver a presentation, using proper speaking techniques and effectively use the computer generated presentation.

Standard 5: Demonstrate knowledge of database software. (1709.S.5)

Database Software Objectives
Students will:
1709.5.1 Create a database file and enter data into the database.
1709.5.2 Sort a database file and create a printed document of the information.
1709.5.3 Update a database file.

Standard 6: Demonstrate knowledge of other relevant technical computer applications as appropriate. (1709.6.1)

Other Computer Applications Objectives
Students will:
1709.6.1 Discuss and demonstrate the efficient use of other various types of software.

Standard 7: Demonstrate a fundamental knowledge of computer programming languages. (1709.S.7)

Computer Programming Languages Objectives

Students will:

1709.7.1 Define a computer program, and identify programs written in two different languages.

1709.7.2 List four of the most popular programming languages used today, and match each with its appropriate environment.

Standard 8: Demonstrate knowledge of program development. (1709.S.8)

Program Development Objectives

Students will:

1709.8.1 Define the basic steps in the programming cycle.

1709.8.2 Identify and describe the most common flowchart symbols.

1709.8.3 Describe the differences between a system flowchart and a program flowchart.

1709.8.4 Describe file organization and access for sequential files, indexed files, and relative (or direct) files.

Standard 9: Utilize a programming language. (1709.S.9)

Programming Language Objectives

Students will:

1709.9.1 Define a programming problem, and plan a solution to the problem.

1709.9.2 Code, test and debug the program you designed.

1709.9.3 Provide appropriate documentation for the program.

Web Development and Support

This course is an introduction to web site development and web server support.

Standard 1: Demonstrate knowledge of the structure and functions of the World Wide Web (WWW). (1711.S.1)

World Wide Web Objectives
Students will:
1711.1.1 Describe the structure of the www.
1711.1.2 Discuss the various types and uses of web pages.
1711.1.3 Discuss the development and uses of HTML.

Standard 2: Demonstrate knowledge of web publishing. (1711.S.2)

Web Publishing Objectives
Students will:
1711.2.1 Effectively utilize an HTML editor.
1711.2.2 Plan and code a site, then post it on the www.
1711.2.3 Register a site with a search engine.
1711.2.4 Discuss the purpose of a domain name, and the procedure for obtaining a domain name.

Standard 3: Discuss proper procedures for accessing the WWW. (1711.S.3)

WWW Objectives
Students will:
1711.3.1 Discuss the importance and implications of an Acceptable Use Policy.
1711.3.2 Demonstrate the use of appropriate screening software.
1711.3.3 Discuss the concepts of ethical behavior, security, and user privacy on the WWW.

Standard 4: Demonstrate knowledge of web support procedure. (1711.S.4)

Web Support Procedure Objectives
Students will:
1711.4.1 Define web server.
1711.4.2 Setup and configure a web server, and perform daily administrative and maintenance tasks on it.
1711.4.3 Maintain a log.

Drafting Specialization - Architectural

This course will provide students the opportunity to specialize in architectural drawing and design, including plumbing, electrical and HVAC systems. The student will choose one of these areas to do in-depth study during this course.

Standard 1: Demonstrate the ability to design and draw domestic and commercial piping systems. (1721.S.1)

Commercial Piping Systems Objectives
Students will:

1721.1.1 Demonstrate knowledge of domestic and commercial piping system terminology and materials.
1721.1.2 Demonstrate the ability to interpret and draw domestic and commercial piping schematic flow diagrams.
1721.1.3 Demonstrate the ability to use a CAD system to design and develop drawings for domestic and commercial piping.

Standard 2: Demonstrate the ability to design and draw electrical systems. (1721.S.2)

Electrical Systems Objectives
Students will:

1721.2.1 Demonstrate knowledge of electrical system terminology and materials.
1721.2.2 Demonstrate the ability to interpret and draw electrical diagrams.
1721.2.3 Demonstrate the ability to use a CAD system to design and develop drawings for electrical systems.

Standard 3: Demonstrate the ability to design and draw HVAC systems. (1721.S.3)

HVAC Systems Objectives
Students will:

1721.3.1 Demonstrate knowledge of HVAC system terminology and materials.
1721.3.2 Demonstrate the ability to interpret and draw HVAC diagrams.
1721.3.3 Demonstrate the ability to use a CAD system to design and develop drawings for HVAC systems.

Standard 4: Apply architectural techniques to design and draw building structures. (1721.S.4)

Building Structures Objectives
Students will:

1721.4.1 Demonstrate knowledge of building styles, material selection and price estimates and architectural terms.
1721.4.2 Demonstrate the ability and knowledge to determine structural design required for client needs and purposes.
1721.4.3 Draw and dimension all necessary drawings for the completion of the structure, including floor plan, elevations and exterior presentation (two point, three point, etc.), etc.
1721.4.4 Demonstrate the ability to use a CAD system to design and develop architectural drawings.

Drafting Specialization-Civil

This course will provide students the opportunity to specialize in civil drafting and design, including and introduction to mapping, cartography techniques, and elementary structural steel design.

Standard 1: Utilize civil drawing techniques and proper cartography to develop accurate maps and construction drawings. (1723.S.1)

Maps and Construction Drawings Objectives
Students will:

1723.1.1 Demonstrate a knowledge of common maps, earth directions (latitude, longitude, relationship to sea level), convert azimuth to bearings and reverse, plot traverses, contours, profiles and other math computations.
1723.1.2 Draw/plot land from legal descriptions and/or write legal descriptions from notes.
1723.1.3 Demonstrate understanding of structural design and of weight supports (bridge, tower, road designs).

Standard 2: Demonstrate the ability to design and draw structural steel fabrications. (1723.S.2)

Structural Steel Fabrications Objectives
Students will:

1723.2.1 Demonstrate knowledge of structural terms, symbols and materials (steel, concrete, etc.).
1723.2.2 Demonstrate familiarity with sheer moment, stress and methods to compute required structural size.
1723.2.3 Demonstrate ability to correctly design and draw structural members and connections.
1723.2.4 Draw plans of elevations and pictorials.
1723.2.5 Demonstrate the ability to use a CAD system to design and develop drawings for steel fabrications.

Standard 3: Utilize CAD and MAPP software to create drawings from field notes. (1723.S.3)

CAD and MAPP Software Objectives
Students will:

1723.3.1 Demonstrate knowledge of field surveying notes and their applications to plan drawings.
1723.3.2 Complete downloading and editing of raw data to achieve the appropriate format.
1723.3.3 Demonstrate knowledge of modeling and overlap using surveying data.

Drafting Specialization - Mechanical

This course will introduce students to mechanical drafting, including the application of dimensioning techniques, assembly and detail drawings, pictorial views and common threads and fasteners. This course will provide the training to apply these applications using a CAD system.

Standard 1: Demonstrate the proper use and knowledge of advanced dimensioning techniques. (1725.S.1)

Advanced Dimensioning Techniques Objectives
Students will:
1725.1.1 Demonstrate knowledge of advanced dimensioning terminology and basic principals of fit selection.
1725.1.2 Apply tolerance dimensions, positional and form tolerance symbols.

Standard 2: Construct various types of assembly and detail drawings. (1725.S.2)

Assembly and Detail Drawings Objectives
Students will:
1725.2.1 Identify types of assembly drawings, detail parts within, and dimension detailed assembly drawings.
1725.2.2 Draw title and revision blocks, make and record drawing revisions, specify shop notes, and draft the necessary bill of materials on a drawing.
1725.2.3 Draw sectional and detailed working assembly drawings.

Standard 3: Identify and draw common threads and fasteners. (1725.S.3)

Threads and Fasteners Objectives
Students will:
1725.3.1 Demonstrate knowledge of common threaded fasteners, thread forms, series and classification of fits.
1725.3.2 Specify keys, keyways and taper pins, etc.
1725.3.3 Draw threaded fasteners using detailed and schematic representations.

Standard 4: Use computer assisted drafting to produce drawings, demonstrating competency in using advanced CAD systems. (1725.S.4)

CAD Systems Objectives
Students will:
1725.4.1 Use advanced drawing and editing features within a CAD system.
1725.4.2 Obtain numerical and database information from a CAD system.
1725.4.3 Use operating system functions within the CAD program.
1725.4.4 Demonstrate the ability to efficiently print/plot specified drawings.
1725.4.5 Develop 3-D objects on a CAD system.
1725.4.6 Use specialized CAD software to design and develop mechanical drawings and models (Mechanical Desktop).
1725.4.7 Develop 3-D objects using CNC.

Drafting Techniques

This course will introduce students to techniques used in advanced orthographic projection, including dimensioning, sectioning, auxiliary views, revolutions, pattern development and advanced CAD.

Standard 1: Apply proper sectioning techniques to fully describe the interior of an object on a drawing. (1727.S.1)

Proper Sectioning Techniques Objectives
Students will:
1727.1.1 Describe the purpose of a cutting plane and cutting plane line, and properly draw them.
1727.1.2 Draw various ANSI standard section lines used for general sections, steel, concrete, etc.
1727.1.3 Describe the differences between a full, half, revolved, aligned, offset, removed and broken out sections, and use sectioning techniques to complete drawings.

Standard 2: Identify and construct pictorial views. (1727.S.2)

Pictorial Views Objectives
Students will:
1727.2.1 Construct oblique and isometric drawings, including exploded and sectional views.
1727.2.2 Apply standard, horizontal and reverse axes in isometric drawings.
1727.2.3 Draw non-isometric lines, circles arcs, and curved lines.

Standard 3: Draw primary and secondary auxiliary views and revolutions. (1727.S.3)

Auxiliary Views and Revolutions Objectives
Students will:
1727.3.1 Demonstrate knowledge of primary auxiliary views.
1727.3.2 Draw secondary auxiliary views and explain their use.
1727.3.3 Demonstrate knowledge of revolutions and their use.

Standard 4: Apply descriptive geometry techniques to solve graphical problems. (1727.S.4)

Geometry Techniques Objectives
Students will:
1727.4.1 Determine the true length of a line, true view of a plane and the true angle between two planes.
1727.4.2 Determine the intersection between lines, planes, and surfaces.

Standard 5: Use proper techniques to draw patterns and developments. (1727.S.5)

Patterns and Developments Objectives
Students will:
1727.5.1 Develop rectangular prisms, cylinders, pyramids and cones.
1727.5.2 Demonstrate knowledge of transition pieces.
1727.5.3 Apply development techniques to shop patterns.

Standard 6: Apply the rules of dimensioning to dimension drawings, using architectural, engineering and metric measurements. (1727.S.6)

Rules of Dimensioning Objectives
Students will:

1727.6.1 Layout, measure and construct lines with the architectural, engineering and metric scales.
1727.6.2 Describe and apply unidirectional and aligned systems of dimensioning.
1727.6.3 Apply standard dimensioning techniques for a hole, countersink, counter bore and knurling.
1727.6.4 Properly dimension axonometric drawings.

Standard 7: Use computer assisted drafting to produce drawings, demonstrating the ability to customize a CAD system. (1727.S.7)

Computer Assisted Drafting Objectives
Students will:
1727.7.1 Create and use various prototype drawings using custom developed line types, hatch patterns and text styles.
1727.7.2 Modify CAD menu to perform additional and/or new operations.
1727.7.3 Demonstrate the ability to modify operating system files to facilitate CAD operations and load and run a lisp routine.

Fundamentals Of Drafting

This course will introduce students to the basic fundamentals of drafting and geometric construction. Students will become familiar with drafting equipment and methodology used in industry. This course will provide basic understanding of drafting techniques necessary to allow students to progress to CAD.

Standard 1: Identify, explore, and evaluate career opportunities related to drafting and design. (1729.S.1)

Drafting and Design Objectives
Students will:
1729.1.1 Describe a variety of careers related to drafting and design, and the training necessary to be successful in those careers.
1729.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of drafting and design.
1729.1.3 Identify sources of information about careers in drafting.

Standard 2: Identify and properly use a variety of basic drafting equipment and materials. (1729.S.2)

Basic Drafting Equipment and Materials Objectives
Students will:
1729.2.1 Describe and properly use standard drafting tools and machines such as triangles, protractors, scales, erasing shield, pencils, pens, erasers, compass and dividers.
1729.2.2 List the standard size sheets for drawing, and describe the difference between tracing paper, vellum and drafting film.

Standard 3: Apply mathematical skills related to drafting and design. (1729.S.3)

Mathematical Skills Objectives
Students will:
1729.3.1 Perform mathematical computations as they relate to creating accurate drawings.
1729.3.2 Interpret various charts and graphs used to display numerical data.
1729.3.3 Layout, measure and construct lines with the architectural scales.

Standard 4: Demonstrate proper drafting techniques when solving a variety of drafting problems. (1729.S.4)

Drafting Objectives
Students will:
1729.4.1 Identify and draw the various standard ANSI lines, borders and title blocks used in the drafting/design industry.
1729.4.2 Properly draw basic geometric shapes using equipment, and layout basic geometric constructions to demonstrate bisection, perpendicular, parallel, tangent, division, etc.
1729.4.3 Demonstrate proper techniques for lettering freehand and with mechanical lettering devices.

Standard 5: Demonstrate proper techniques to develop multi-view drawings using orthographic projection. (1729.S.5)

Multi-View Drawings Objectives
Students will:
1729.5.1 Apply proper isometric sketching techniques to aid in visualization of orthographic drawings.
1729.5.2 Arrange and layout the three principle views of an object on a standard ANSI sheet, using

proper centering techniques.

1729.5.3 Select the proper views necessary to completely describe an object, and complete technical drawings using these views.

Standard 6: Apply general rules to dimension drawings, using architectural measurements. (1729.S.6)

Dimension Drawings Objective

Students will:

1729.6.1 List and draw basic dimensions lines such as extension, dimension and leader lines.

Standard 7: Use computer assisted drafting to produce drawings, demonstrating basic functions of CAD. (1729.S.7)

CAD Objectives

Students will:

1729.7.1 Properly use software to create drawings using basic commands.

1729.7.2 Dimension the drawing, using appropriate commands.

1729.7.3 Properly save and plot a drawing.

Cosmetology Science

This course will provide the student with information on human anatomy and the effects of the chemistry of products used in cosmetology.

Standard 1: Demonstrate knowledge of anatomy. (1731.S.1)

Anatomy Objectives
Students will:
1731.1.1 Match terms associated with body systems to the correct definitions.
1731.1.2 Match the body systems to the correct functions.
1731.1.3 Plot the cell divisions and their functions.
1731.1.4 Match types of tissues to their correct functions.
1731.1.5 Select from a list the major body organs.
1731.1.6 Distinguish between anabolism and catabolism.
1731.1.7 Distinguish between cartilage and ligament.
1731.1.8 Match the parts of a bone to the correct descriptions.
1731.1.9 Discriminate the function of the bones.
1731.1.10 Identify bones of the face and head.
1731.1.11 Identify bones of the arm and hand.
1731.1.12 Match types of joints to the correct locations.
1731.1.13 Match types of muscles to their correct descriptions.
1731.1.14 Match the parts of a muscle to their correct descriptions.
1731.1.15 Identify muscles of the face and head.
1731.1.16 Match muscles of the face and head to the correct functions.
1731.1.17 Identify types of nerve.
1731.1.18 Distinguish between sensory and motor nerves.

Standard 2: Demonstrate a knowledge of the composition of various products used in cosmetology. (1731.S.2)

Cosmetology Objectives
Students will:
1731.2.1 Match terms associated with product chemistry to the correct definitions.
1731.2.2 Identify symbols of various elements.
1731.2.3 Distinguish between acids and bases.
1731.2.4 Interpret the basic characteristics of pH scale.
1731.2.5 Recall the chemistry of water.
1731.2.6 Distinguish between organic and inorganic chemistry.
1731.2.7 Distinguish between physical and chemical changes.
1731.2.8 Distinguish between elements and compounds.
1731.2.9 Define solution.
1731.2.10 Distinguish between a suspension and an emulsion.
1731.2.11 Match products used for sterilization and sanitation in the salon to their proper functions.
1731.2.12 Select from a list the basic facts about shampoo.
1731.2.13 Describe the chemical reaction of hair relaxers and permanent waves.
1731.2.14 State the chemical reaction of various hair color products.
1731.2.15 Match various products used in cosmetology to the correct chemical make-up.

Fundamentals of Business Management

This course will provide the knowledge and skills to operate and manage a cosmetology salon.

Standard 1: Demonstrate knowledge and skills needed for opening a salon. (1733.S.1)

Salon Objectives
Students will:
1733.1.1 Match terms associated with site planning to the correct definitions.
1733.1.2 Repeat the characteristics of various types of salons.
1733.1.3 Match types of ownerships to the correct descriptions.
1733.1.4 Distinguish between lease and rent.
1733.1.5 Name clauses that may be included in a complex lease.
1733.1.6 Describe a tentative contract.
1733.1.7 Identify factors to consider before owning, leasing, or renting a business.
1733.1.8 State permits, licenses, and public utilities necessary for opening a salon.
1733.1.9 Select from a list sources available for financing a business.
1733.1.10 Plan a salon site.

Standard 2: Demonstrate knowledge of salon management. (1733.S.2)

Salon Management Objectives
Students will:
1733.2.1 Match terms associated with salon planning and management to the correct definitions.
1733.2.2 Cite factors to consider when selecting the salon name.
1733.2.3 Select from a list basic implements and equipment needed for the salon.
1733.2.4 Select from a list color schemes appropriate for a salon.
1733.2.5 Choose basic rules for preparing window displays.
1733.2.6 Explain decorating the reception area.
1733.2.7 Formulate the styling area arrangements.
1733.2.8 List items to consider when setting up a dispensary (supply room).
1733.2.9 Tally items to include in a salon operating budget.
1733.2.10 Match types of insurance available to the correct definitions.
1733.2.11 Describe taxes and laws pertaining to a salon.
1733.2.12 Match various salary alternatives to the proper definitions.
1733.2.13 Name supplies which should be purchased.
1733.2.14 Describe methods of advertising.
1733.2.15 Design a salon.

Fundamentals of Hairstyling

This course will provide the knowledge and skills for working with hair and scalp, scalp treatment, shampoo and rinse, facial shapes, hair styles, wiggery, hair relaxer and hair coloring.

Standard 1: Demonstrate knowledge and skill in structure of hair and scalp. (1735.S.1)

Hair and Scalp Objectives
Students will:
1735.1.1 Match terms associated with scalp and hair analysis to the correct definitions.
1735.1.2 Discuss the composition of hair.
1735.1.3 Identify the layers of hair root shaft.
1735.1.4 Identify parts of the hair root area.
1735.1.5 Match parts of the hair root area to the correct functions.
1735.1.6 Match types of hair texture to their characteristics.
1735.1.7 Distinguish between hair porosity and hair elasticity.
1735.1.8 Identify sterilization and sanitation rules to observe during scalp and hair analysis.
1735.1.9 Identify scalp disorders.
1735.1.10 Match scalp disorders to the proper treatments.
1735.1.11 Identify scalp disorders that should not be treated in a salon.
1735.1.12 Name conditions that affect hair growth.
1735.1.13 Prescribe treatments for scalp and hair problems.

Standard 2: Display knowledge and skill in scalp treatment. (1735.S.2)

Scalp Treatment Objectives
Students will:
1735.2.1 Match terms associated with brushing and scalp treatment to the correct definitions.
1735.2.2 Select from a list types of scalp treatments.
1735.2.3 Identify scalp conditions that can be treated by a cosmetologist.
1735.2.4 Match scalp problems to the necessary treatments.
1735.2.5 Identify equipment needed for scalp treatments.
1735.2.6 Select from a list general safety precautions to observe while performing scalp treatments.
1735.2.7 Develop safety precautions to observe while using high-frequency current.
1735.2.8 Distinguish between methods of applying high-frequency current for scalp treatment.
1735.2.9 Distinguish between the use of the ultra-violet ray and the infra-red ray.
1735.2.10 Prescribe treatment for scalp problems.
1735.2.11 Drape a patron.
1735.2.12 Brush hair for a scalp treatment.
1735.2.13 Perform scalp manipulations.
1735.2.14 Apply direct and indirect high-frequency current treatments to scalp.
1735.2.15 Apply therapeutic rays to scalp.
1735.2.16 Apply heat cap scalp treatment.

Standard 3: Demonstrate the ability to give a shampoo and apply rinse. (1735.S.3)

Shampoo and Apply Rinse Objectives
Students will:
1735.3.1 Match terms associated with shampoos and rinses to the correct definitions.
1735.3.2 Itemize types of shampoos.
1735.3.3 Match types of shampoos to the correct functions.
1735.3.4 Identify types of rinses.
1735.3.5 Match types of rinses to the correct functions.
1735.3.6 State safety precautions to observe during a shampoo.
1735.3.7 Identify parts of the pH scale.

1735.3.8 Give a shampoo.
1735.3.9 Apply acid rinse.
1735.3.10 Apply crème rinse.
1735.3.11 Apply instant color rinse.

Standard 4: Coordinate facial shapes with hair types. (1735.S.4)

Facial Shapes With Hair Types Objectives
Students will:
1735.4.1 Match terms associated with facial shapes and body structures to the correct definitions.
1735.4.2 Identify facial shapes.
1735.4.3 Match facial shapes to the correct characteristics.
1735.4.4 Identify facial profiles.
1735.4.5 Match facial profile shapes to the correct characteristics.
1735.4.6 Identify body structures that are used to determine hairstyles.
1735.4.7 Match facial shapes to the appropriate hairstyles.
1735.4.8 Match facial profile shapes to appropriate hairstyles.
1735.4.9 Match body structures to the appropriate hairstyles.
1735.4.10 Label the major sections of the head.
1735.4.11 Indicate proportions of the ideal face.
1735.4.12 Measure facial features.

Standard 5: Demonstrate how to make a shaping and wave. (1735.S.5)

Shaping and Wave Objectives
Students will:
1735.5.1 Match terms associated with shaping to the correct definitions.
1735.5.2 Identify the styling section of the head.
1735.5.3 Match styling sections of the head to the correct functions.
1735.5.4 State the purpose of a shaping.
1735.5.5 Identify geometric lines used in hair shaping.
1735.5.6 Identify open and closed ends of a shaping.
1735.5.7 Arrange in order the steps for establishing a natural part in hair.
1735.5.8 Arrange in order the steps to finding natural hair growth direction.
1735.5.9 Select from a list rules to observe when making shaping.
1735.5.10 Section head into five styling sections.
1735.5.11 Make a shaping.
1735.5.12 Make a wave.
1735.5.13 Make a C-shape.

Standard 6: Demonstrate the ability to form pin curls. (1735.S.6)

Pin Curls Objectives
Students will:
1735.6.1 Match terms associated with pin curls to the correct definitions.
1735.6.2 Identify parts of a pin curl.
1735.6.3 Match parts of a pin curl to the correct functions.
1735.6.4 Identify types of pin curl stems.
1735.6.5 Match types of pin curl stems to the correct functions.
1735.6.6 Compare pin curl stems in relation to the pick-up line.
1735.6.7 Identify types of pin curls.
1735.6.8 Match types of pin curls to the correct functions.
1735.6.9 Identify bases used in forming a pin curl.
1735.6.10 Match bases used in forming a pin curl to the correct functions.
1735.6.11 Identify implements used to form a pin curl.
1735.6.12 Match implements used to form a pin curl to the correct functions.

1735.6.13 Select from a list rules to observe while forming a pin curl.
1735.6.14 Place sculpture curls in a shaping.
1735.6.15 Place stand up curls for volume.
1735.6.16 Form flare curls.
1735.6.17 Place ridge curls in set.
1735.6.18 Place curved or C-based curls in a shaping.
1735.6.19 Form a skip wave.
1735.6.20 Complete a basic set using various types of pin curls.

Standard 7: Demonstrate the ability to set hair using various roller techniques. (1735.S.7)

Roller Techniques Objectives
Students will:
1735.7.1 Match terms associated with roller sets to the correct definitions.
1735.7.2 Identify implements used in roller sets.
1735.7.3 Match implements used in roller sets to the correct functions.
1735.7.4 Identify parts of a roller curl.
1735.7.5 Match parts of a roller curl to the correct descriptions.
1735.7.6 Locate roller bases.
1735.7.7 Match roller diameters to the correct descriptions.
1735.7.8 Distinguish between volume and indentation.
1735.7.9 Identify various hair partings.
1735.7.10 Match various hair partings.
1735.7.11 Discuss various roller placements.
1735.7.12 Name products used in roller sets.
1735.7.13 State sanitary measures to observe during roller sets.
1735.7.14 State rules to observe during roller sets.
1735.7.15 Place rollers for a half-bang.
1735.7.16 Place rollers for a forward side.
1735.7.17 Place rollers for a wave side.
1735.7.18 Place rollers in back for basic set.
1735.7.19 Place vertical rollers in back to create design and wave pattern.

Standard 8: Apply the knowledge and skill of finger waving principles. (1735.S.8)

Finger Waving Principles Objectives
Students will:
1735.8.1 Match terms associated with finger waving to the correct definitions.
1735.8.2 Identify equipment and materials used in finger waving.
1735.8.3 Explain hair growth directions.
1735.8.4 Select from a list rules to observe during finger waving.
1735.8.5 Indicate the main characteristics of good finger waves.
1735.8.6 Demonstrate the ability to finger wave a full head of hair using a side part.

Standard 9: Demonstrate the ability to backcomb into a desired style. (1735.S.9)

Backcomb Objectives
Students will:
1735.9.1 Match terms associated with comb-outs to the correct definition.
1735.9.2 Identify equipment used in comb-outs.
1735.9.3 Match hairdressing fundamentals to the correct applications.
1735.9.4 Specify backcombing techniques.
1735.9.5 Describe sectional teasing.
1735.9.6 Detail common problems found when backcombing.
1735.9.7 Apply basic comb-out techniques.
1735.9.8 Backcomb hair.

1735.9.9 Lace hair.
1735.9.10 Back brush hair.
1735.9.11 Stretch a wave.

Standard 10: Demonstrate the ability to style hair using the thermal method. (1735.S.10)

Thermal Method Objectives
Students will:
1735.10.1 Match terms associated with thermal hairstyling to the correct definitions.
1735.10.2 Distinguish between soft press and hard press.
1735.10.3 Define hair texture.
1735.10.4 Distinguish between elasticity and porosity.
1735.10.5 Match types of scalps to the problems that might occur during thermal hairstyling.
1735.10.6 Match equipment used in thermal work to the correct functions.
1735.10.7 Arrange in order the steps to follow when tempering thermal irons.
1735.10.8 State factors to consider when determining the degree of heat to be used when thermal hairstyling.
1735.10.9 Recall how to clean the thermal irons.
1735.10.10 Match types of hair presses to the correct definitions.
1735.10.11 Match types of thermal curling to the proper characteristics.
1735.10.12 Select from a list problem areas to observe while thermal hairstyling.
1735.10.13 Select from a list safety precautions to observe while thermal hairstyling.
1735.10.14 Give a soft perm.
1735.10.15 Thermal curl hair.
1735.10.16 Thermal wave hair.
1735.10.17 Make side flare, sculpture, spiral (poker), and flip curls using the thermal method.

Standard 11: Demonstrate the knowledge needed to air wave hair. (1735.S.11)

Air wave Hair Objectives
Students will:
1735.11.1 Match terms associated with air waving to the correct definitions.
1735.11.2 Identify implements and equipment used in air waving.
1735.11.3 Match implements and equipment used in air waving to the correct functions.
1735.11.4 Note products used in air waving.
1735.11.5 Arrange in order the steps to air wave hair.
1735.11.6 Recall safety precautions to observe while air waving hair.
1735.11.7 Air wave hair using blow dryer and round brush.
1735.11.8 Use curling iron to style hair.
1735.11.9 Use hot comb to style hair.
1735.11.10 Curl hair using spring-control curling iron.

Standard 12: Apply knowledge and skill of hair shaping. (1735.S.12)

Hair Shaping Objectives
Students will:
1735.12.1 Match terms associated with haircutting and shaping to the correct definitions.
1735.12.2 Identify implements and equipment needed to give a haircut or shaping.
1735.12.3 Match implements and equipment needed to give a haircut or shaping to the proper functions.
1735.12.4 Identify the parts of a pair of scissors.
1735.12.5 Identify the parts of a razor.
1735.12.6 Identify the parts of a pair of thinning shears.
1735.12.7 Match the common names for head shapes to the technical names.
1735.12.8 Compare hair texture as it relates to haircutting and shaping.
1735.12.9 Distinguish between low and high elevation haircutting and shaping.

1735.12.10 Select from a list purposes for sectioning hair for a haircut or shaping.
1735.12.11 Distinguish between length and perimeter in haircutting and shaping.
1735.12.12 Distinguish between tapering and thinning the hair.
1735.12.13 Recall in order, steps for cutting and shaping hair to the bond structure.
1735.12.14 Distinguish between beveling with a razor and tapering shears.
1735.12.15 Identify various elevations used in haircutting and shaping.

Standard 13: Demonstrate knowledge and skill in wiggery. (1735.S.13)

Wiggery Objectives
Students will:
1735.13.1 Match terms associated with hairpieces to the correct definitions.
1735.13.2 Match types of wig materials to the correct descriptions.
1735.13.3 Repeat federal government requirements for labeling hairpieces.
1735.13.4 Identify types of hairpieces.
1735.13.5 Match hairpieces to the correct method of construction.
1735.13.6 Identify implements and equipment used for styling hairpieces.
1735.13.7 List the steps in measuring the head to fit a wig.
1735.13.8 Recall methods of sizing and blocking a wig.
1735.13.9 Distinguish between products for cleaning hairpieces.
1735.13.10 Arrange in order the steps for cleaning a hairpiece.
1735.13.11 Style a wiglet.
1735.13.12 Style a wig.

Standard 14: Apply the principles of permanent waving. (1735.S.14)

Permanent Weaving Objectives
Students will:
1735.14.1 Examine and analyze clients hair and scalp.
1735.14.2 Identify clients preparation prior to perm.
1735.14.3 Demonstrate a shaping on client.
1735.14.4 Section and block the head in a straight back pattern.
1735.14.5 Section and block the head in a double halo pattern.
1735.14.6 Section and block the head in a dropped crown position.
1735.14.7 Select rods, section and subsection head, wrap off-base curls.
1735.14.8 Select rods, section and subsection head, wrap off-base curls.
1735.14.9 Select rods, section and subsection head, wrap half-base curls.
1735.14.10 Wrap hair with single end paper.
1735.14.11 Wrap hair with double end paper.
1735.14.12 Wrap hair with book end paper.
1735.14.13 Identify choice of waving lotion and apply.
1735.14.14 Develop test curls.
1735.14.15 Application of neutralizer-direct method.
1735.14.16 Application of neutralizer-splash on method.
1735.14.17 Develop piggyback wrap for long hair.
1735.14.18 Develop a body permanent.
1735.14.19 Give acid-balanced permanent wave using preheated dryer.

Standard 15: Demonstrate the ability to give a chemical hair relaxer. (1735.S.15)

Chemical Hair Relaxer Objectives
Students will:
1735.15.1 Match terms associated with chemical relaxing to the correct definitions.
1735.15.2 Distinguish between hair density and hair texture.
1735.15.3 Distinguish between elasticity and porosity.
1735.15.4 Identify the structure of the hair.

1735.15.5 Describe the parts of the hair structure.
1735.15.6 Match products used in the chemical relaxing process to their correct descriptions.
1735.15.7 Recall methods of applying chemical relaxer to the hair.
1735.15.8 Itemize implements used for chemical relaxing.
1735.15.9 Arrange in order the steps for taking a strand test.
1735.15.10 Select from a list safety precautions to observe during the chemical relaxing process.
1735.15.11 Arrange in order the steps for a chemical relaxer.
1735.15.12 Arrange in order the steps for a relaxer retouch.
1735.15.13 Arrange in order the steps for a chemical blow-out.
1735.15.14 Complete a record chart.
1735.15.15 Determine the proper chemical relaxer and procedure to follow when given a specific situation.
1735.15.16 Section hair for a chemical relaxer.
1735.15.17 Straighten hair using a thio chemical relaxer.
1735.15.18 Straighten hair using a sodium hydroxide (caustic) relaxer.

Standard 16: Demonstrate knowledge and skill in hair coloring. (1735.S.16)

Hair Coloring Objectives
Students will:
1735.16.1 Match terms associated with hair coloring to the correct definitions.
1735.16.2 Describe hair structure as it relates to hair coloring.
1735.16.3 List types of hair coloring products.
1735.16.4 Match hair coloring products to the general coloring characteristics.
1735.16.5 Arrange in order the steps in performing a predisposition test.
1735.16.6 List the primary and secondary colors.
1735.16.7 Distinguish between warm and cool colors.
1735.16.8 Distinguish between single application and double application services.
1735.16.9 Distinguish between shades and stages of hair coloring.
1735.16.10 Describe nonprofessional hair color products.
1735.16.11 Distinguish between henna and soap cap.
1735.16.12 Demonstrate different methods to apply color fillers.
1735.16.13 Demonstrate pre-softening of hair.
1735.16.14 Describe the effect of oxidation in hair coloring.
1735.16.15 Select from a list information included on a hair color chart.
1735.16.16 Label hair care products used after coloring.
1735.16.17 Select from a list corrective measures for hair color problems.
1735.16.18 Formulate information necessary for completing a record card.
1735.16.19 Recall safety precautions to observe during hair coloring.
1735.16.20 Correct hair color problems.
1735.16.21 Apply a virgin tint darker than natural hair color.
1735.16.22 Apply a tint retouch.
1735.16.23 Apply color for lighter shade (single application).
1735.16.24 Apply instant temporary color.
1735.16.25 Apply semi-permanent color.

Standard 17: Demonstrate knowledge of skill of hair lightening. (1735.S.17)

Hair Lightening Objectives
Students will:
1735.17.1 Match terms associated with lightening and toning to the correct definitions.
1735.17.2 Match hair structures as they relate to lightening and toning to the correct descriptions.
1735.17.3 Define hair porosity.
1735.17.4 Match lightening and toning products to the general lightening characteristics.
1735.17.5 Repeat the stages of hair lightening.
1735.17.6 Distinguish between shades and stages of hair coloring.

1735.17.7 Recall primary and secondary colors.
1735.17.8 Select from a list color rules to observe during lightening and toning.
1735.17.9 Distinguish between warm and cool colors.
1735.17.10 Connect hydrogen peroxide as a developer for tints and lighteners.
1735.17.11 Distinguish between a virgin lightener and a lightener retouch.
1735.17.12 Select from a list the proper ways of selecting a toner color.
1735.17.13 Indicate the chemical composition of penetrating products used in lightening and toning.
1735.17.14 Distinguish between color lifting and color grabbing.
1735.17.15 Arrange in order the steps for giving a predisposition test.

Orientation to Cosmetology

This course will provide the student with information about the future of the cosmetology field, sanitation practices and salon equipment.

Standard 1: Summarize the occupational outlook of cosmetology. (1737.S.1)

Cosmetology Objectives
Students will:
1737.1.1 Match terms associated with orientation to the correct definitions.
1737.1.2 Discuss facts concerning the occupational outlook of cosmetology.
1737.1.3 Identify various types of occupations that can be acquired through cosmetology training.
1737.1.4 Select from a list specific areas involved in cosmetology lab work.
1737.1.5 Select from a list student requirements for the cosmetology program.

Standard 2: Identify general implements and equipment used in a salon. (1737.S.2)

Salon Objectives
Students will:
1737.2.1 Match terms associated with implements and equipment to the correct definitions.
1737.2.2 Identify types of combs.
1737.2.3 Identify types of brushes.
1737.2.4 Identify types of rollers
1737.2.5 Identify types of clips.
1737.2.6 Identify air-waving equipment (quick service).
1737.2.7 Identify haircutting implements.
1737.2.8 Identify equipment used for facials and scalp treatments.
1737.2.9 Identify implements used in thermal waving.
1737.2.10 Identify implements used in permanent waving.
1737.2.11 Identify implements used in hair lightening and hair coloring.
1737.2.12 Identify manicure and pedicure implements.
1737.2.13 Identify implements used in styling hairpieces.
1737.2.14 Identify implements and equipment used shampooing.
1737.2.15 Identify drying equipment.
1737.2.16 Identify implements and equipment used in hairstyling.
1737.2.17 Distinguish between wet and dry sanitizers.

Standard 3: Demonstrate knowledge of rules concerning sanitation and safety. (1737.S.3)

Sanitation and Safety Objectives
Students will:
1737.3.1 Match terms associated with safety to the correct definitions.
1737.3.2 Match the colors of the safety color code with their correct use.
1737.3.3 Identify rules for personal safety.
1737.3.4 Select from a list sanitation and sterilization rules that can prevent some personal safety hazards.
1737.3.5 Select physical and chemical methods of sterilization.
1737.3.6 Arrange in order steps for using a wet sanitizer.
1737.3.7 Identify how bacteria can become a personal health hazard.
1737.3.8 Distinguish between pathogenic and nonpathogenic bacteria.
1737.3.9 Match types of pathogenic bacteria to diseases they cause.
1737.3.10 Select rules for general shop safety.
1737.3.11 Label the components of the fire triangle.
1737.3.12 Match the classes of fire to the correct definitions.
1737.3.13 Match types of fire extinguishers to the class of fire each is best suited to extinguish.

1737.3.14 Complete a safety pledge form.
1737.3.15 Complete a safety inspection checklist.
1737.3.16 State general shop safety rules.
1737.3.17 Recall sanitation rules.

Professional Practices – Skin and Nails

This course will provide the student with the knowledge and skills to be able to provide manicures, pedicures, massage, facials, apply full makeup and various methods of hair removal.

Standard 1: Demonstrate knowledge of manicuring and pedicuring. (1739.S.1)

Manicuring and Pedicuring Objectives
Students will:
1739.1.1 Match terms associated with manicuring and pedicuring to the correct definitions.
1739.1.2 Identify the most common shapes for manicuring women's nails.
1739.1.3 Identify the most common shapes for manicuring men's nails.
1739.1.4 Match supplies used in manicuring and pedicuring with the correct functions.
1739.1.5 Identify equipment and implements used in manicuring and pedicuring.
1739.1.6 Match implements and equipment to their correct functions.
1739.1.7 Distinguish between a regular manicure and a man's manicure.
1739.1.8 Describe hot oil manicuring.
1739.1.9 Identify disorders of the nail.
1739.1.10 Match disorders of the nail to the correct cause.
1739.1.11 Identify diseases of the nail.
1739.1.12 Match diseases with their symptoms and causes.
1739.1.13 Select from a list the safety precautions to observe while giving a manicure or pedicure.
1739.1.14 Name sanitary measures to observe while giving a manicure and pedicure.
1739.1.15 Arrange implements and materials for a manicure and pedicure.
1739.1.16 Give a regular manicure.
1739.1.17 Apply liquid polish.
1739.1.18 Give a hot oil manicure.
1739.1.19 Give a pedicure.
1739.1.20 Repair split or broken nails.
1739.1.21 Apply plastic nails.
1739.1.22 Apply sculpture nails.
1739.1.23 Apply brush-on nails.
1739.1.24 Give a man's manicure.

Standard 2: Identify various structures and functions of the nail. (1739.S.2)

Nail Objectives
Students will:
1739.2.1 Match terms associated with nail structure to the correct definitions.
1739.2.2 Identify parts of the nail.
1739.2.3 Match parts of the nail to the correct functions.
1739.2.4 Identify various shapes of nail growth.
1739.2.5 Name characteristics of nail growth.

Standard 3: Illustrate knowledge of massage. (1739.S.3)

Massage Objectives
Students will:
1739.3.1 Match terms associated with massage manipulations to the correct definitions.
1739.3.2 Signify the effects of massage.
1739.3.3 Identify various types of massage.
1739.3.4 Match types of massage manipulations to the correct characteristics.
1739.3.5 Explain safety precautions to observe while applying massage manipulations.

Standard 4: Demonstrate the ability to give a facial. (1739.S.4)

Facial Objectives
Students will:
1739.4.1 Match terms associated with facials to their correct definitions.
1739.4.2 Match the structures of the skin to the correct functions.
1739.4.3 Identify muscle and nerve motor points of the face.
1739.4.4 Develop reasons for giving facials.
1739.4.5 Match skin disorders and diseases to the correct descriptions.
1739.4.6 Match types of primary lesions to the correct descriptions.
1739.4.7 Match types of secondary lesions to the correct descriptions.
1739.4.8 Match the products used in giving a facial to the correct definitions.
1739.4.9 Distinguish between facial packs and facial masks.
1739.4.10 Identify implements and equipment used in giving a facial.
1739.4.11 Match implements and equipment used in giving a facial to the correct functions.
1739.4.12 State the types of skin problems that require a facial.
1739.4.13 Select proper treatment for skin conditions that require a facial.
1739.4.14 Arrange in order the steps in giving a plain facial.
1739.4.15 Mark sanitary measures to observe while giving a facial.
1739.4.16 State safety precautions to observe while giving a facial.
1739.4.17 Complete a safety precaution checklist.
1739.4.18 Drape patron for a facial.
1739.4.19 Give a plain facial.
1739.4.20 Apply facial mask and pack.
1739.4.21 Give facial manipulations.
1739.4.22 Arch the eyebrows.

Standard 5: Demonstrate the ability to apply full makeup. (1739.S.5)

Makeup Objectives
Students will:
1739.5.1 Match terms associated with makeup to the correct definitions.
1739.5.2 Match cosmetics used in applying makeup to the correct characteristics.
1739.5.3 Identify facial shape.
1739.5.4 Identify facial problems.
1739.5.5 Proportion a face.
1739.5.6 Differentiate fair, dark, and oriental skin tones.
1739.5.7 Distinguish between daytime and evening makeup.
1739.5.8 Match facial shapes and features to problem areas needing correctional makeup.
1739.5.9 Note procedures needed to correct various facial problem areas.
1739.5.10 Arrange in order the steps to applying daytime makeup.
1739.5.11 Distinguish between strip lashes and individual lashes.
1739.5.12 Arrange in order the steps for cleaning strip lashes.
1739.5.13 Select from a list sanitary measures to observe while applying makeup.
1739.5.14 Find safety precautions to observe while applying makeup.
1739.5.15 Apply daytime makeup.
1739.5.16 Apply evening makeup.
1739.5.17 Apply corrective makeup.
1739.5.18 Apply strip lashes.
1739.5.19 Apply individual lashes.

Standard 6: Demonstrate knowledge of various methods of hair removal. (1739.S.6)

Hair Removal Objectives
Students will:
1739.6.1 Match terms associated with hair removal to the correct definitions.

1739.6.2 Describe the types of hair removal.
1739.6.3 Choose methods of permanent hair removal.
1739.6.4 Itemize methods of temporary hair removal.
1739.6.5 Identify implements used in temporary hair removal.
1739.6.6 Match products and implements to the correct functions.
1739.6.7 Select from a list safety precautions to observe while temporarily removing hair.
1739.6.8 Tweeze eyebrow hair.
1739.6.9 Apply wax depilatory.
1739.6.10 Apply chemical depilatory.

Diesel Engine Components

This course will introduce students to the fundamentals of engine components used in diesel equipment technology.

Standard 1: Demonstrate knowledge of cylinder head components and service. (1741.S.1)

Cylinder Head Components and Service Objectives
Students will:
1741.1.1 Define terms and major parts associated with a cylinder head assembly.
1741.1.2 Disassemble, service and assemble a cylinder head and components.

Standard 2: Demonstrate knowledge of piston and connecting rod assemblies. (1741.S.2)

Piston and Connecting Rod Assemblies Objectives
Students will:
1741.2.1 Define terms and major parts associated with piston and connecting rod assemblies.
1741.2.2 Identify types of pistons and piston rings, and list their functions.
1741.2.3 Disassemble, service, measure for wear and assemble piston and connecting assembly.

Standard 3: Demonstrate knowledge and skill in the operation of timing gears. (1741.S.3)

Timing Gears Objectives
Students will:
1741.3.1 Define terms and major parts associated with camshafts, gears and the valve train.
1741.3.2 Explain valve timing on a two-cycle and four-cycle engine.
1741.3.3 Describe gears found in a typical gear train and identify those that are marked to insure correct valve timing.
1741.3.4 Remove, service and install a camshaft.

Standard 4: Demonstrate knowledge of cylinder blocks. (1741.S.4)

Cylinder Blocks Objectives
Students will:
1741.4.1 Define terms and major parts associated with cylinder blocks and a typical frame design.
1741.4.2 Identify advantages of a removable liner over an integral cylinder bore.
1741.4.3 Remove, inspect and install a cylinder liner.
1741.4.4 Clean, inspect, pressure test, service, repair and replace components of an engine block.

Standard 5: Demonstrate knowledge of crankshafts. (1741.S.5)

Crankshafts Objectives
Students will:
1741.5.1 Define terms and major parts associated with crankshafts and bearings.
1741.5.2 Describe the effects of the arrangement of crankshaft throws, and how the arrangement of throws relates to the number of cylinders in the engine.
1741.5.3 Identify ways crankshaft balance is maintained.
1741.5.4 Clean, inspect, service and repair crankshafts, oil passages; passage plugs, and journal.

Standard 6: Demonstrate knowledge of common types of bearings and seals. (1741.S.6)

Bearings and Seals Objectives

Students will:

1741.6.1 Define terms and major parts associated with bearings and seals.

1741.6.2 Discuss the advantages and disadvantages of various types of bearings.

1741.6.3 Identify common methods of lubricating bearings, and causes of bearing failure.

1741.6.4 Identify types of anti-friction, ball, roller, and needle bearings.

1741.6.5 Remove and install a plain bearing and an anti-friction bearing; check and reload bearing setting, using spring scale methods.

1741.6.6 Identify places where dynamic seals are used.

Diesel Engine Tune Up and Troubleshooting

This course will introduce students to the fundamentals of tune up and troubleshooting used in diesel equipment technology.

Standard 1: Diagnose engine problems and prepare for engine testing. (1743.S.1)

Engine Objectives
Students will:
1743.1.1 Define terms associated with operation and maintenance.
1743.1.2 List inspections to include in a checklist during normal operation.
1743.1.3 List factors to include in the procedure for stopping a diesel engine.
1743.1.4 Match the causes of an engine misfiring with the corrective actions.
1743.1.5 Identify causes of engine knock.
1743.1.6 Identify causes of an overheated engine.
1743.1.7 Identify four causes of smoky exhaust.

Standard 2: Demonstrate knowledge of tune-up/adjustment of a diesel engine. (1743.S.2)

Tune-up/Adjustment of A Diesel Engine Objectives
Students will:
1743.2.1 Define terms associated with tune-up and adjustment.
1743.2.2 Identify major items to include in a visual inspection checklist.
1743.2.3 Tune-up a Cummins diesel engine.
1743.2.4 Tune-up a Detroit diesel engine.
1743.2.5 Tune-up a 3400 series Caterpillar diesel engine.

Standard 3: Demonstrate knowledge of troubleshooting a diesel engine. (1743.S.3)

Diesel Engine Objectives
Students will:
1743.3.1 Match terms associated with diagnosis and testing of engines with the correct definitions.
1743.3.2 Arrange in order the steps in diagnosing and testing an engine.
1743.3.3 Identify major checkpoints when inspecting a diesel engine.
1743.3.4 Complete a list of major checks to make when operating an engine.
1743.3.5 Identify factors necessary for an engine to produce horsepower.
1743.3.6 Select the possible causes of a diesel engine being hard to start or not starting.
1743.3.7 Select the possible causes of a diesel engine starting but not running.
1743.3.8 Identify items which cause a diesel engine to misfire.
1743.3.9 Select items which cause a diesel engine to knock.
1743.3.10 Select the items which cause a diesel engine to overheat.
1743.3.11 Identify items which cause a diesel engine to have lack of power.
1743.3.12 Select the items which cause a diesel engine to use too much oil.
1743.3.13 Identify causes of high oil pressure.
1743.3.14 List causes of low oil pressure.

Diesel Preventative Maintenance and Inspection

This course will introduce students to the fundamentals of medium and heavy truck preventative maintenance & inspection used in diesel equipment technology.

Standard 1: Demonstrate knowledge of the engine systems maintenance. (1745.S.1)

Engine Systems Objectives
Students will:
1745.1.1 Check engine components
1745.1.2 Check engine operation
1745.1.3 Inspect the fuel system
1745.1.4 Inspect air induction and exhaust system
1745.1.5 Inspect cooling system
1745.1.6 Inspect the lubrication system

Standard 2: Demonstrate knowledge of under hood and cab maintenance. (1745.S.2)

Hood and Cab Maintenance Objectives
Students will:
1745.2.1 Inspect instruments and controls
1745.2.2 Inspect safety equipment
1745.2.3 Inspect hardware
1745.2.4 Inspect heating and AC system

Standard 3: Demonstrate knowledge of electrical/electronic systems. (1745.S.3)

Electrical/Electronic Systems Objectives
Students will:
1745.3.1 Inspect battery and starting system
1745.3.2 Inspect charging system
1745.3.3 Inspect lighting system

Standard 4: Demonstrate knowledge of frame and chassis maintenance. (1745.S.4)

Frame and Chassis Maintenance Objectives
Students will:
1745.4.1 Inspect air brake system
1745.4.2 Inspect drive train
1745.4.3 Inspect steering and suspension system
1745.4.4 Inspect tires and wheels
1745.4.5 Inspect frame and 5th wheel

Diesel Support Systems

This course will introduce students to the fundamentals of support systems used in diesel equipment technology.

Standard 1: Demonstrate knowledge of lubrication and cooling systems. (1747.S.1)

Lubrication and Cooling Systems Objectives
Students will:
1747.1.1 Match terms associated with the cooling system with the correct definitions.
1747.1.2 Identify two functions of the cooling system and the effects of an engine running too hot or too cold.
1747.1.3 Identify the parts in an air cooling system.
1747.1.4 Identify types of radiators and functions of the radiator cap.
1747.1.5 Identify three types of fans used in cooling systems and types of gauges.
1747.1.6 Identify purpose for using coolant filter or conditioner in a cooling system.
1747.1.7 Select function of the thermostat.
1747.1.8 Identify the primary parts of a water pump and fan.
1747.1.9 Match terms associated with the lubrication system with the correct definitions.
1747.1.10 Identify types of lubrication systems and their components.
1747.1.11 Identify two types of oil filters and sources of oil contamination.
1747.1.12 Identify types of oil pumps.
1747.1.13 Identify purposes of lubricating valves.
1747.1.14 Distinguish between internally and externally mounted oil coolers.

Standard 2: Demonstrate knowledge of air intake and exhaust systems. (1747.S.2)

Air Intake and Exhaust Systems Objectives
Students will:
1747.2.1 Match terms and definitions of an air intake and exhaust system and name the parts of each system.
1747.2.2 Match types of air cleaners with their processes.
1747.2.3 Identify methods of scavenging the cylinders on a two-stroke cycle engine.
1747.2.4 Identify advantages of a turbo charged engine.
1747.2.5 Test an engine for air flow restriction.
1747.2.6 Inspect a turbo charger for satisfactory operation.

Standard 3: Demonstrate knowledge of starting and charging systems. (1747.S.3)

Starting and Charging Systems Objectives
Students will:
1747.3.1 Match terms and definitions of a starting system and identify major types of systems.
1747.3.2 Name components of an electric starting system.
1747.3.3 List low temperature starting aids.
1747.3.4 Match terms associated with charging system and name it's components.
1747.3.5 Test output of alternators on and off of vehicle.

Standard 4: Demonstrate knowledge of engine retarders. (1747.S.4)

Engine Retarders Objectives
Students will:
1747.4.1 Match terms related to engine brakes and retarders with the correct definitions.
1747.4.2 Identify advantages of the Jacobs engine brake.

Standard 5: Demonstrate knowledge of fuel system components. (1747.S.5)

Fuel System Objectives

Students will:

1747.5.1 Match terms related to fuel injection systems with their correct definitions.

1747.5.2 Identify types and major functions of fuel injection systems.

1747.5.3 Match terms and definitions related to fuel system components and the parts of a fuel system with their functions.

1747.5.4 Identify fuel tank maintenance problems.

1747.5.5 Match types of fuel lines with their purposes.

1747.5.6 Identify the purpose of a fuel transfer pump.

1747.5.7 Identify types and characteristics of fuel filters and separators used for a fuel filtration system.

Standard 6: Demonstrate knowledge of governor. (1747.S.6)

Governor Objectives

Students will:

1747.6.1 Match terms related to governors with their correct definitions and the purposes of a governor.

1747.6.2 Identify basic types of governors using flyweights.

Diesel Truck Chassis Concepts

This course will introduce students to the fundamentals of heavy truck chassis used in diesel equipment technology.

Standard 1: Demonstrate knowledge of transmissions, clutches and drive lines. (1749.S.1)

Transmissions, Clutches and Drive Lines Objectives
Students will:

1749.1.1 Remove and replace automatic and manual transmissions.
1749.1.2 Remove and replace single-plate and two-plate clutch (transmission removed).
1749.1.3 Replace flywheel drive lugs for two-plate clutch.
1749.1.4 Align engine flywheel housing.
1749.1.5 Inspect pressure plate for reuse, remove and replace clutch release bearing and replace pilot bearing.
1749.1.6 Rebuild 4 or 5 speed manual transmission for medium-duty truck.
1749.1.7 Remove and replace transmission for air shift mechanisms and rebuild air shift mechanism.
1749.1.8 Overhaul twin counter shaft and three counter shaft transmissions.
1749.1.9 Replace transmission input shaft separate from transmission overhaul.
1749.1.10 Replace speedometer drive gear separate from transmission overhaul.
1749.1.11 Remove and replace shift lever housing from transmission separate from transmission overhaul.
1749.1.12 Rebuild shift lever housing.
1749.1.13 Remove and reinstall driveline.
1749.1.14 Set and replace universal joints.
1749.1.15 Remove and replace yoke (driveline removed).
1749.1.16 Remove and replace driveline center bearings.
1749.1.17 Remove, rebuild and replace rear differential carrier assembly in tandem.
1749.1.18 Remove, rebuild and reinstall front differential carrier assembly in tandem.
1749.1.19 Remove, rebuild and reinstall interaxle differential.
1749.1.20 Replace pinion seal separate from carrier overhaul.
1749.1.21 Remove and reinstall two-speed shift unit.

Standard 2: Demonstrate knowledge of steering, suspensions, tires/wheels. (1749.S.2)

Steering, Suspensions, Tires/Wheels Objectives
Students will:

1749.2.1 Lubricate steering and suspension components.
1749.2.2 Check and correct power steering belt tension and correct power steering fluid level.
1749.2.3 Replace tie rod ends.
1749.2.4 Replace center link and idler cam.
1749.2.5 Diagnose steering and suspension problems.
1749.2.6 Set toe-in to manufacturer specifications.
1749.2.7 Remove and replace king pin and bushings.
1749.2.8 Service wheel bearings and seals.
1749.2.9 Repair or rebuild spring assembly and shackles, hangers, and pads.
1749.2.10 Remove and replace torque arm bushing.
1749.2.11 Inspect tires, identify tire, rim, type, and size and match new tire for replacement.
1749.2.12 Recognize causes and remedies of abnormal tire wear.
1749.2.13 Inspect and replace wheel assembly, measure run out, out of roundness, and inspect for flaws.
1749.2.14 Diagnose tire and wheel malfunction.

Standard 3: Demonstrate knowledge of the air brake system. (1749.S.3)

Air Brake Systems Objectives

Students will:

1749.3.1 Inspect brake lines for condition and leaks.
1749.3.2 Service drums, calipers, and rotors.
1749.3.3 Test and diagnose air brake system.
1749.3.4 Remove and replace various air system components.
1749.3.5 Service air brake system plumbing.
1749.3.6 Remove and replace service brake chamber diaphragm.
1749.3.7 Adjust brakes.
1749.3.8 Remove and replace brake shoes.
1749.3.9 Remove and replace spring brake chambers.
1749.3.10 Remove, replace, and adjust air governor.
1749.3.11 Repair, replace, or adjust air pressure relief valve.
1749.3.12 Rebuild air compressors and governors.

Fundamentals of Diesel Equipment Technology

This course will introduce students to the fundamentals of diesel equipment technology. Students will become familiar with the proper use of hand and power tools, precision measurement, and basic oxyacetylene welding and electric welding; identify, tear down, clean, inspect and rebuild various components of an engine.

Standard 1: Identify, explore, and evaluate career opportunities related to diesel equipment technology. (1751.S.1)

Diesel Equipment Technology Objectives
Students will:
1751.1.1 Describe a variety of careers related to diesel equipment technology, and the training necessary to be successful in those careers.
1751.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of diesel equipment technology.
1751.1.3 Identify sources of information about careers in diesel equipment technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to diesel equipment technology. (1751.S.2)

Basic Safety Rules and Equipment Objectives
Students will:
1751.2.1 Recognize and follow general safety guidelines, including the selection and use of protective equipment and fire extinguishers.
1751.2.2 Describe safety precautions necessary when using hazardous materials.
1751.2.3 Describe the precautions to be taken when welding in confined areas.

Standard 3: Identify basic hand tools used in diesel equipment technology and perform various operations. (1751.S.3)

Basic Hand Tools Objectives
Students will:
1751.3.1 Choose the proper hand tools for given applications and describe the proper care and maintenance of each.
1751.3.2 Demonstrate adjustments necessary with each tool.
1751.3.3 Drill holes with a drill press.
1751.3.4 Read micrometer and venire micrometer settings.
1751.3.5 Select tools used to restore external and internal threads.

Standard 4: Demonstrate knowledge of fasteners. (1751.S.4)

Fasteners Objective
Students will:
1751.4.1 Identify typical fasteners, including washers, devices for locking nuts or bolts, and common types of snap rings and use them in given applications.

Standard 5: Demonstrate knowledge of basic diesel test equipment. (1751.S.5)

Basic Diesel Test Equipment Objective
Students will:
1751.5.1 Identify and use various types of test equipment and service tools.

Standard 6: Demonstrate knowledge of the principles of two and four stroke cycle engine operation. (1751.S.6)

Cycle Engine Operation Objectives

Students will:

1751.6.1 Review the operation of a two stroke and four stroke engine.

1751.6.2 Identify basic parts of a diesel engine.

Standard 7: Demonstrate knowledge of diesel fuel, engine lubricating oils, and coolants. (1751.S.7)

Diesel Fuel, Engine Lubricating Oils, and Coolants Objectives

Students will:

1751.7.1 Define terms and grades associated with diesel fuels, lubricants and coolants meeting ASTM standards.

1751.7.2 List four functions of engine oil and engine oil additives.

1751.7.3 Identify oil contaminants.

1751.7.4 Identify types of cooling systems used on modern engines.

1751.7.5 Explain the function of the parts of a liquid cooling system.

1751.7.6 Identify requirements of a good antifreeze.

Basic Electronics

This course will introduce students to the analysis of basic AC and DC circuits, electronic devices, and basic electronic circuits.

Standard 1: Analyze basic DC and AC circuits. (1761.S.1)

DC and AC Circuits Objectives
Students will:
1761.1.1 Explain the purpose of resistors and resistive circuits.
1761.1.2 Solve electronic problems using Ohm's Law and power formulas.
1761.1.3 Construct and analyze series, parallel, and combination resistive circuits.
1761.1.4 Demonstrate knowledge of voltage and current dividers.
1761.1.5 Demonstrate AC and DC test equipment usage.
1761.1.6 Utilize Kirchoff's Laws to solve multi-source circuits.
1761.1.7 Demonstrate knowledge of network theorems.
1761.1.8 Demonstrate knowledge of magnetism, magnetic units, and electro-magnetic induction.
1761.1.9 Construct and analyze AC and DC circuits.
1761.1.10 Solve for inductance and inductive reactance.
1761.1.11 Solve for capacitance and capacitive reactance.
1761.1.12 Construct timing circuits and solve for time constants.
1761.1.13 Solve for resonance and resonant circuit parameters.
1761.1.14 Construct various filter circuits.

Standard 2: Identify and use electronic devices. (1761.S.2)

Electronic Devices Objectives
Students will:
1761.2.1 Describe semiconductor materials.
1761.2.2 Explain the PN junction.
1761.2.3 Explain semiconductor diode construction and operation.
1761.2.4 Describe PNP and NPN transistor operation.
1761.2.5 Explain Field-Effect Transistor (FET) operation.
1761.2.6 Use thyristors for voltage control devices.
1761.2.7 Cross-reference semiconductor type numbers and case styles.
1761.2.8 Use special purpose diodes and analyze their operation.
1761.2.9 Explain visual character displays.
1761.2.10 Demonstrate testing of diodes, transistors, and thyristors.

Standard 3: Construct electronic circuits. (1761.S.3)

Electronic Circuits Objectives
Students will:
1761.3.1 Illustrate analog and digital signals.
1761.3.2 Calculate amplifier gains.
1761.3.3 List and explain characteristics of amplifier circuits.
1761.3.4 Construct amplifiers and observe their outputs.
1761.3.5 Construct oscillators and observe their outputs.
1761.3.6 Construct multivibrators and observe their outputs.
1761.3.7 Explain modulation of amplitude, frequency, and pulse-code.
1761.3.8 Construct diode and I.C. rectifiers and compare them to I.C. rectifiers.
1761.3.9 Troubleshoot power supplies.
1761.3.10 Describe circuit configuration for various amplifier systems.

1761.3.11 Explain class A, B and C operation of amplifier.
1761.3.12 Give analysis of the Common-Emitter (CE) amplifier configuration.
1761.3.13 Explain types of output distortion.
1761.3.14 Troubleshoot amplifier circuit inputs and outputs.
1761.3.15 Analyze inputs and outputs of OP-Amps.

Standard 4: Apply digital fundamentals to electronic circuits. (1761.S.4)

Electronic Circuits Objectives
Students will:
1761.4.1 Demonstrate knowledge of binary numbers and arithmetic.
1761.4.2 Demonstrate knowledge of octal numbers and arithmetic.
1761.4.3 Convert between numbering systems.
1761.4.4 Interpret logic diagrams.
1761.4.5 Draw symbols for basic logic gates.
1761.4.6 Construct basic logic gates from discrete components and I.C's and monitor their outputs.
1761.4.7 Construct and analyze basic logic circuits.

Fundamentals of Electricity

This course will introduce students to the fundamental skills related to electricity. Students will become familiar with the use of meters and other equipment used in the field of electricity, and learn how to construct a variety of circuits.

Standard 1: Identify, explore/evaluate career opportunities related to electricity. (1763.S.1)

Electricity Objectives
Students will:
1763.1.1 Describe a variety of careers related to electricity, and the training necessary to be successful in those careers.
1763.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of electricity.
1763.1.3 Identify sources of information about careers in electricity.

Standard 2: Demonstrate knowledge of electrical safety. (1763.S.2)

Electrical Safety Objectives
Students will:
1763.2.1 Describe the effect of current on the human body.
1763.2.2 List general safety precautions when working with electricity.
1763.2.3 Identify various types of safety devices used with electricity.
1763.2.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1763.2.5 List and describe the safe use of basic hand and power tools used in the field of electricity.

Standard 3: Interpret blueprints, schematics and technical orders. (1763.S.3)

Blueprints, Schematics and Technical Orders Objectives
Students will:
1763.3.1 Demonstrate knowledge of blueprint reading.
1763.3.2 Demonstrate knowledge of schematic reading.
1763.3.3 Explain the reasons for building plans and specifications.

Standard 4: Apply electrical math concepts. (1763.S.4)

Electrical Math Concepts Objectives
Students will:
1763.4.1 Demonstrate knowledge of Ohm's law and power formulas.
1763.4.2 Calculate branch circuit loads.

Standard 5: Demonstrate the proper use and care of electrical meters. (1763.S.5)

Electrical Meters Objective
Students will:
1763.5.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 6: Construct and analyze basic circuits.

Basic Circuits Objectives
Students will:
1763.6.1 Describe the electrical classification of conductors, insulators, and semi-conductors.

1763.6.2 Describe electrical current and differentiate between the different kinds of current.
1763.6.3 Define voltage, current, resistance, and power.
1763.6.4 List, and schematically represent the components that make up a basic electrical circuit.
1763.6.5 Connect dry cells into various series and parallel arrangements and measure and record voltage readings across each battery configuration.
1763.6.6 Conduct experiments that demonstrate the production of an electromotive force, obtaining voltage readings from experiments.
1763.6.7 Construct, solve and troubleshoot series, parallel and complex circuits.

Standard 7: Demonstrate proper techniques in making connections/wire splices. (1763.S.7)

Connections/Wire Splices Objectives
Students will:
1763.7.1 Properly remove insulation and make tap, pigtail and western union splices.
1763.7.2 Apply solderless terminals, wire nuts, and insulating tape to the ends of various sized wires.

Standard 8: Perform basic soldering techniques.

Basic Soldering Objectives
Students will:
1763.8.1 Demonstrate proper use and care for soldering tools and equipment.
1763.8.2 Demonstrate correct stripping, tinning, and soldering procedures.
1763.8.3 Identify characteristics of a good solder connection.

Industrial and Commercial Wiring

This course will introduce students to the special installation and characteristics of industrial and commercial wiring according to the National Electrical Code.

Standard 1: Install conduit and raceways. (1765.S.1)

Conduit and Raceways Objectives
Students will:
1765.1.1 List various types of conduit and their uses.
1765.1.2 List NEC code requirements for installation and construction of various conduit and raceway systems.

Standard 2: Maintain lighting and receptacle outlets. (1765.S.2)

Lighting and Receptacle Outlets Objectives
Students will:
1765.2.1 Explain and install emergency lighting systems.
1765.2.2 Diagnose and repair various lighting, receptacle and outlet problems.

Standard 3: Demonstrate knowledge of industrial grounding methods. (1765.S.3)

Industrial Grounding Method Objective
Students will:
1765.3.1 Explain grounding of single-phase and three-phase systems.

Standard 4: Demonstrate knowledge and skills associated with transformers. (1765.S.4)

Transformers Objectives
Students will:
1765.4.1 List safety procedures used when working with transformers.
1765.4.2 Describe construction and operating characteristics of transformers.
1765.4.3 Illustrate various types of transformer connections and discuss the results of these connections.
1765.4.4 Connect dual-voltage transformers for high and low voltage operation.

National Electrical Code

This course will introduce students to the National Electrical Code, and prepare them for the state license testing.

Standard 1: Demonstrate skills in the use of the National Electrical Code (NEC) Handbook. (1767.S.1)

National Electrical Code (NEC) Handbook Objectives
Students will:

1767.1.1 Explain history and purpose of the CODE (Article 90).
1767.1.2 Explain chapter layout of the NEC handbook.
1767.1.3 List installations that the NEC covers and those not covered.
1767.1.4 List sequence of organizational components of the NEC.
1767.1.5 List steps for finding information in the NEC handbook.
1767.1.6 Demonstrate knowledge of how to read and understand the NEC.
1767.1.7 Explain and interpret tables from the NEC handbook.

Standard 2: Apply calculations to assure that NEC standards are met. (1767.S.2)

NEC Standards Objectives
Students will:

1767.2.1 Calculate conductor size and ampacity, overcurrent protection, grounding, bonding, and grounded conductor size.
1767.2.2 Calculate service entrance for single-family and multi-family dwelling units.
1767.2.3 Calculate service entrance for a commercial building.
1767.2.4 Calculate conduit and box conductor fill.

Residential Wiring

This course will introduce students to basic circuits, devices, and wiring techniques used in residential dwellings.

Standard 1: Interpret wiring data. (1769.S.1)

Wiring Data Objectives
Students will:
1769.1.1 Draw an electrical layout of a floor plan to meet minimum NEC specifications.
1769.1.2 Draw a cable layout of floor plan.

Standard 2: Install service entrance equipment and material. (1769.S.2)

Equipment and Material Objectives
Students will:
1769.2.1 List components of and calculate minimum size of service entrance needed.
1769.2.2 Indicate clearances for service drop per NEC regulations.
1769.2.3 Describe installations of underground (lateral) service entrance.

Standard 3: Install lighting and receptacle outlets. (1769.S.3)

Lighting and Receptacle Outlets Objectives
Students will:
1769.3.1 Replace existing fixtures, switches, and receptacles.
1769.3.2 Install and troubleshoot single-pole, three-way, and four-way switching circuits.
1769.3.3 Install split-wired receptacle circuits.

Standard 4: Install protective devices. (1769.S.4)

Protective Devices Objectives
Students will:
1769.4.1 Explain differences between overload, overcurrent, and short circuit.
1769.4.2 Install ground fault circuit breakers and GFCI receptacle outlets.
1769.4.3 Describe the operations of fuses and circuit breakers.

Standard 5: Install appliances and special circuits. (1769.S.5)

Appliances and Special Circuits Objectives
Students will:
1769.5.1 Discuss NEC requirements for appliances and special circuits.
1769.5.2 Install baseboard and wall mounted heating units, with controls.
1769.5.3 Install various fans.
1769.5.4 Install and troubleshoot water heating units.

Standard 6: Install low-voltage systems. (1769.S.6)

Low-Voltage Systems Objectives
Students will:
1769.6.1 Install and troubleshoot door bell and chime systems.
1769.6.2 Install low-voltage thermostats for heat control.
1769.6.3 Install and/or explain low-voltage landscape lighting systems.

Rotating Devices and Control Circuitry

This course will introduce students to basic control circuits, pilot devices, motor controls, relays, motor braking circuits, alternators and generators and how to troubleshoot AC and DC motors.

Standard 1: Demonstrate safe work habits. (1771.S.1)

Safe Work Habits Objectives
Students will:
1771.1.1 List and explain personal and electrical safety rules applicable to rotating equipment.
1771.1.2 List and explain hand and tool safety rules applicable to rotating equipment.

Standard 2: Interpret blueprints, schematics, and block diagrams for control circuitry. (1771.S.2)

Control Circuitry Objectives
Students will:
1771.2.1 Draw a block diagram of a motor control system.
1771.2.2 Demonstrate knowledge of elementary wiring diagrams and ladder logic.
1771.2.3 Install motor control centers and systems, using wiring diagrams.
1771.2.4 List and identify motor and motor control symbols.

Standard 3: Demonstrate knowledge and skills applicable to pilot devices. (1771.S.3)

Pilot Devices Objectives
Students will:
1771.3.1 Explain purpose and uses of pilot devices.
1771.3.2 Explain and list various types of electronic and mechanical sensors and pilot devices.
1771.3.3 Explain counter circuits.
1771.3.4 Install and troubleshoot various pilot devices and their circuits.

Standard 4: Demonstrate knowledge and skills related to motor controls. (1771.S.4)

Motor Controls Objectives
Students will:
1771.4.1 Explain the difference between manual and automatic circuits.
1771.4.2 List the equipment and parts needed for automatic circuits.
1771.4.3 Identify basic motor control circuits.
1771.4.4 Connect basic AC and DC circuits for automatic and manual control.
1771.4.5 Explain and demonstrate basic troubleshooting of control circuits.
1771.4.6 Install jogging and plugging circuits.
1771.4.7 Install reversing circuits.
1771.4.8 Demonstrate the use of a phase rotation meter.

Standard 5: Apply knowledge and skills to relays. (1771.S.5)

Relays Objectives
Students will:
1771.5.1 Describe and explain relays and relay circuits.
1771.5.2 Identify and install overload relays in control circuits.
1771.5.3 Identify and install potential-type relays in control circuits.
1771.5.4 Explain the difference between relay and magnetic starters.
1771.5.5 Explain troubleshooting techniques of relay and magnetic starters.
1771.5.6 Check various relays for faults or defects.

1771.5.7 Explain, check, and adjust various types of time delay relays.

Standard 6: Differentiate between the different types of motor braking circuits. (1771.S.6)

Motor Braking Circuits Objectives
Students will:
1771.6.1 Explain the various types of braking circuits for AC and DC motors.
1771.6.2 Describe dynamic braking circuits for AC and DC motors.

Standard 7: Troubleshoot AC and DC motors. (1771.S.7)

AC and DC Motors Objectives
Students will:
1771.7.1 Describe the various types of single-phase and three-phase AC motors and DC motors.
1771.7.2 Install, check, and troubleshoot various types of single-phase and three-phase motors in a circuit.
1771.7.3 Install, check, and troubleshoot various types of DC motors in a circuit.

Standard 8: Demonstrate knowledge and skills related to alternators and generators. (1771.S.8)

Alternators and Generators Objectives
Students will:
1771.8.1 List the major parts of an alternator and a generator and explain the function of each part.
1771.8.2 List and describe the different types of alternators and generators.
1771.8.3 Check alternators and generators for faults and defects.

Special Applications In Electronics

This is a special course for more advanced students to introduce them to the basic theory and operation of programmable logic controllers, fiber optics, and lasers.

Standard 1: Demonstrate a working knowledge of programmable logic controllers (P.L.C.'s). (1773.S.1)

Programmable Logic Controllers Objectives
Students will:
1773.1.1 Define terms associated with PLC's.
1773.1.2 Illustrate special symbols associated with PLC's.
1773.1.3 Demonstrate programming basics.
1773.1.4 Program relay, timer, counter and sequencer instructions.
1773.1.5 Edit a program.
1773.1.6 Utilize the EEPROM memory module.

Standard 2: Demonstrate a working knowledge of fiber optics. (1773.S.2)

Fiber Optics Objectives
Students will:
1773.2.1 Define terms and special schematic symbols associated with fiber optics.
1773.2.2 Construct fiber optic circuitry.
1773.2.3 Use test equipment to analyze inputs and outputs of fiber optic circuits.
1773.2.4 Splice fibers and apply fiber optic connectors.

Standard 3: Demonstrate a working knowledge of lasers. (1773.S.3)

Lasers Objectives
Students will:
1773.3.1 Demonstrate safe work habits with lasers.
1773.3.2 Define terms and special schematic symbols associated with laser equipment and laser circuitry.
1773.3.3 Demonstrate knowledge of laser and light physics.
1773.3.4 Troubleshoot laser power supplies.
1773.3.5 Construct laser circuits.
1773.3.6 Perform laser experiments.
1773.3.7 Analyze findings from tests and measurements taken on laser circuits.
1773.3.8 Troubleshoot laser circuitry.

Analog Circuits

This course will introduce students to the skills and technology involved in analog circuits and their use in the modern electronics field.

Standard 1: Construct basic analog circuits and use a variety of test equipment to analyze and troubleshoot them. (1781.S.1)

Analog Circuits Objectives
Students will:
1781.1.1 Describe the chemical bonding in semiconductor devices.
1781.1.2 Graphically illustrate characteristic curves for diodes and transistors used in analog circuitry.
1781.1.3 Match light characteristics and properties for various opto-electronic devices.
1781.1.4 Utilize solid state testing equipment to determine the usability of diodes and transistors.
1781.1.5 Use oscilloscopes to determine the proper operation and gain of various amplifiers.
1781.1.6 Interpret parts manuals for ordering components.
1781.1.7 Write reports on troubleshooting methods, providing steps taken to locate and replace faulty components and sub-systems.

Standard 2: Construct amplifier circuits and predict results. (1781.S.2)

Amplifier Objectives
Students will:
1781.2.1 Experiment with amplifier biasing methods used to obtain different classes of operations.
1781.2.2 Experiment with various coupling methods between stages of amplification.
1781.2.3 Determine gains of different types of amplifier circuits.

Standard 3: Troubleshoot systems and sub-systems to locate and correct faults. (1781.S.3)

Systems and Sub-systems Objectives
Students will:
1781.3.1 Define an electronic sub-system, an electronic system, and electronic input, process, and output.
1781.3.2 Apply critical thinking skills to sub-system level troubleshooting of electronic systems.
1781.3.3 Illustrate a block diagram of an electronic system.
1781.3.4 Use sub-system input and output measurement data to determine if a system has a fault.
1781.3.5 Write technical reports on the findings of sub-system measurements and evaluation.

Basic AC Circuits

This course will introduce students to the skills and technology involved in AC circuits and their use in the modern electronics field.

Standard 1: Evaluate components used with alternating current. (1783.S.1)

Alternating Current Objectives
Students will:
1783.1.1 Define capacitance, explain the purpose for capacitors in electronic circuits, and how a capacitor stores electrical energy.
1783.1.2 Explain the construction of a capacitor and how the value and voltage ratings relate to size and types.
1783.1.3 Measure the charge and discharge time of various capacitors.
1783.1.4 Define inductance and describe the application of inductive components to electronics.
1783.1.5 Use an L-C analyzer to check the value and condition of various capacitors and inductors.
1783.1.6 Draw the schematic symbols for capacitors, inductors, and transformers.
1783.1.7 Describe basic operation of a transformer.

Standard 2: Utilize basic test equipment to evaluate circuits. (1783.S.2)

Evaluate Circuits Objectives
Students will:
1783.2.1 Use an oscilloscope to observe function generator outputs.
1783.2.2 Measure peak to peak voltages with an oscilloscope.
1783.2.3 Use a meter to measure voltage and current.
1783.2.4 Use a frequency counter to measure frequency.
1783.2.5 Convert voltages between peak to peak and R.M.S. valves.

Standard 3: Evaluate magnetic and electromagnetic properties. (1783.S.3)

Magnetic and Electromagnetic Objectives
Students will:
1783.3.1 Identify, select, handle, and properly store magnetic devices and ferromagnetic materials.
1783.3.2 Construct a simple relay and use it as a control device in a basic electrical circuit.
1783.3.3 Analyze transformer voltage readings for loaded and unloaded conditions.
1783.3.4 Solve mathematical problems related to the use of transformers and transformer turns ratios.
1783.3.5 Perform graphing and graphical analysis of various measured data.

Standard 4: Construct AC circuits and use a variety of test equipment to analyze them. (1783.S.4)

AC Circuits Objectives
Students will:
1783.4.1 Use logarithmic, exponential, and trigonometric functions related to AC circuit analysis.
1783.4.2 Use a magnet to identify various ferrous and non-ferrous materials.
1783.4.3 Identify, select, handle, and properly store magnetic devices and ferromagnetic materials.
1783.4.4 Use oscilloscopes, frequency counters, DMM's and function generators to observe and record voltage, phase, and frequency data for a variety of LR, RC, and RLC circuits.
1783.4.5 Use an L-C analyzer to check the value and condition of various capacitors and inductors.
1783.4.6 Test and determine usability of transformers, inductors, capacitors, and resistors (both fixed value and variable).
1783.4.7 Test and determine usability of relays, solenoids, and other magnetic devices.
1783.4.8 Use computer software to analyze AC circuits.

Basic Solid State Devices and Circuits

This course will introduce students to the skills and technology involved in basic solid state devices and circuits and their use in the modern electronics field.

Standard 1: Demonstrate a fundamental knowledge and practical understanding of analog devices and basic circuits. (1785.S.1)

Analog Devices and Basic Circuits Objectives
Students will:
1785.1.1 Identify different types of diodes and transistors.
1785.1.2 Use diodes to construct half-wave, full-wave, and bridge rectifier circuits.
1785.1.3 Identify anodes and cathodes of diodes and LEDs.
1785.1.4 Identify basic anodes and cathodes of transistors (PNP and NVN).
1785.1.5 Construct and analyze basic transistor amplifiers (CB, CC, and CE).
1785.1.6 Analyze the output waveforms of various filtered and non-filtered power supplies.
1785.1.7 Select, and properly handle, diodes and transistors for various applications in circuits.
1785.1.8 Use cross-reference guides to determine appropriate substitutes for solid-state components.
1785.1.9 Use test instruments to check the static condition of various solid-state components/devices.
1785.1.10 Use an oscilloscope to observe the operation of an amplifier.
1785.1.11 Use proper troubleshooting procedures to find faults in amplifiers.

Standard 2: Demonstrate a fundamental knowledge and practical understanding of digital devices and basic circuits. (1785.S.2)

Digital Devices and Basic Circuits Objectives
Students will:
1785.2.1 Analyze basic logic gates operation with truth table.
1785.2.2 Identify basic logic gates schematic symbols.
1785.2.3 Use logic probe to observe logic gate operation.
1785.2.4 Use oscilloscope to observe logic gate operation.
1785.2.5 Identify pin locations on various I.C. packages.

DC Circuits and Electron Physics

This course will introduce students to the skills and technology in DC circuits and electron physics.

Standard 1: Describe electron physics as it relates to voltage, current and resistance. (1787.S.1)

Electron Physics Objectives
Students will:
1787.1.1 Demonstrate the law of electrical/electrostatic charges (Coulombs Law)
1787.1.2 State the law of magnetism.
1787.1.3 Use a magnet to identify various ferrous and non-ferrous materials.

Standard 2: Analyze D.C. circuits mathematically. (1787.S.2)

D.C. Circuits Objectives
Students will:
1787.2.1 Use calculators to solve algebraic equations for series, parallel, and complex DC circuits.
1787.2.2 Interpret and convert units of measurement for DC circuits.
1787.2.3 Perform calculations for meter and circuit loading effect.
1787.2.4 Use Ohm's Law to analyze circuits.
1787.2.5 Use Kirchoff's Law, Therening's Law, and Norton's Law to analyze circuits.

Standard 3: Demonstrate knowledge of basic safety rules and equipment as it relates to electronics technology. (1787.S.3)

Safety Rules and Equipment Objectives
Students will:
1787.3.1 Follow all safety precautions when working with electricity.
1787.3.2 Explain and demonstrate the proper use and care of tools, machines, and equipment in the
1787.3.3 electronics laboratory.
1787.3.4 Identify, demonstrate proper use and care of, all basic personal safety devices and
1787.3.5 equipment.

Standard 4: Construct DC circuits and analyze them by making various static and dynamic measurements. (1787.S.4)

DC Circuits Objectives
Students will:
1787.4.1 Identify, select, and properly handle resistors, fuses and other protective devices, control
1787.4.2 devices, and EMF producing devices.
1787.4.3 Lay out electronic components with which to construct circuits and sub-systems.
1787.4.4 Use an EMF, conductors, various control devices, protective devices, and various types of loads to construct, observe, and record results of basic electrical circuits.
1787.4.5 Construct and analyze voltage and current divider networks.
1787.4.6 Locate and replace faulty components in series, parallel, and complex DC circuits.
1787.4.7 Locate and repair continuity problems in DC circuits.
1787.4.8 Use an ammeter to measure the current flowing in opened and closed circuits.
1787.4.9 Use power supplies and VOM's/ DMM's to obtain active DC circuit measurements.
1787.4.10 Use an oscilloscope to analyze DC circuitry.
1787.4.11 Use computer software to analyze DC circuits.

Digital Circuits

This course will introduce students to the skills and technology involved in digital circuits and their use in the modern electronics field.

Standard 1: Perform math skills related to digital circuitry. (1789.S.1)

Digital Circuitry Objectives
Students will:
17891.1 Apply boolean algebra to solve logic functions.
17891.2 Perform binary, octal, decimal, and hexadecimal conversions and calculations.
17891.3 Use Kavanaugh maps to simplify logic functions.

Standard 2: Analyze digital circuits mathematically and theoretically. (1789.S.2)

Analyze Digital Circuits Objectives
Students will:
1789.2.1 Operate a transistor as a digital switch.
1789.2.2 Construct and analyze the basic logic gates.
1789.2.3 Assemble and analyze adder circuits.
1789.2.4 Assemble converter circuits and use a seven-segment display to observe their output and operation.
1789.2.5 Construct and analyze combinational logic circuits.
1789.2.6 Explore the digital applications of various families of integrated circuits (TTL, CMOS, etc.).
1789.2.7 Convert AND/OR logic circuits to NAND/NOR logic circuits.

Standard 3: Construct digital circuits and use test equipment to analyze and troubleshoot them. (1789.S.3)

Construct Digital Circuits Objectives
Students will:
1789.3.1 Use logic probes and pulsers to observe the behavior of various digital devices.
1789.3.2 Use oscilloscopes to analyze output waveforms of timing circuits.
1789.3.3 Locate and correct faults in basic logic circuits.

Electronics Specializations

This course will introduce students to the skills and technology involved in the various specializations in the modern electronics field.

Standard 1: Troubleshoot AC and DC circuits. (1791.S.1)

AC and DC Circuits Objectives

Students will:

1791.1.1 Solve simultaneous linear equations for circuit analysis.
1791.1.2 Apply network analysis to solve for unknown variables in DC circuits with multiple voltage sources.
1791.1.3 Perform calculations for internal resistance of voltage sources and maximum power transfer.
1791.1.4 Construct and analyze analog meter circuitry.
1791.1.5 Interpret and determine accuracy of measurements in DC circuits.
1791.1.6 Construct and obtain resistance, voltage, and current readings in passive and active parallel DC circuits.
1791.1.7 Construct and obtain resistance, voltage, and current readings in passive and active complex DC circuits
1791.1.8 Construct and analyze DC circuits that contain multiple voltage sources.
1791.1.9 Construct and obtain resistance, voltage, and current readings in passive and active series DC circuits.
1791.1.10 Solve for unknown values resulting from the use of inductors and capacitors in circuits.
1791.1.11 Restore faulty AC circuits to proper operating conditions.

Standard 2: Troubleshoot active devices and analog circuits. (1791.S.2)

Active Devices and Analog Circuits Objectives

Students will:

1791.2.1 Construct single stage amplifier circuits (common base, common collector, and common emitter).
1791.2.2 Analyze both static and dynamic operating characteristics of various single stage amplifiers.
1791.2.3 Construct and analyze multistage discrete component power amplifiers.
1791.2.4 Explain the applications for field effect transistors and test for usability.
1791.2.5 Identify and test thyristor devices.
1791.2.6 Construct and analyze thyristor circuitry.
1791.2.7 Construct and perform operational tests on oscillator circuits.
1791.2.8 Interpret manuals to determine maintenance procedures.
1791.2.9 Maintain technical logs.
1791.2.10 Construct and analyze voltage and current regulator circuits.
1791.2.11 Locate and correct faults in both regulated and non-regulated power supplies.
1791.2.12 Locate and correct faults in various types of amplifier circuits and systems.

Standard 3: Troubleshoot digital and microprocessor circuits. (1791.S.3)

Digital and Microprocessor Circuits Objectives

Students will:

1791.3.1 Locate and correct faults in oscillator and timer circuits.
1791.3.2 Interpret schematics and block diagrams to determine primary circuits functions.
1791.3.3 Assemble and analyze IC RAM, ROM, and EPROM circuits.
1791.3.4 Examine the operation of microprocessor devices.
1791.3.5 Construct JFET and MOSFET circuits and perform waveform analysis of inputs and outputs.
1791.3.6 Construct and analyze operational and linear IC amplifier circuits.
1791.3.7 Differentiate between, and identify pin arrangements of, various integrated circuits such as;

operational amplifiers, linear IC amps, oscillators, timers, and voltage regulators.
1791.3.8 Construct and analyze active diode circuits, to include comparators.
1791.3.9 Construct and observe outputs of counter circuits driven by timers.
1791.3.10 Construct and analyze a stable, monostable, and bistable multivibrator circuits.
1791.3.11 Assemble and analyze encoders and decoders.
1791.3.12 Locate and correct faults in multivibrator circuits.
1791.3.13 Troubleshoot and repair advanced digital circuitry.
1791.3.14 Analyze digital systems to determine faulty subsystem assemblies.
1791.3.15 Locate and repair faulty interfacing of microprocessor systems.
1791.3.16 Analyze specification/data sheets for digital components.
1791.3.17 Assemble and analyze multiplexers and demultiplers.
1791.3.18 Construct and observe the operation of shift-registers.
1791.3.19 Load and execute basic programs in microprocessors.

Standard 4: Prepare reports on status of systems and sub-system. (1791.S.4)

Systems And Sub-System Objectives
Students will:
1791.4.1 Identify a problem related to an electronic system, and form a hypothesis.
1791.4.2 State the need to research the problem, list the procedures for carrying out the research, and conduct the research in accordance with the listed procedures.
1791.4.3 Present the finding to a group of peers, stating conclusions based upon the research findings.
1791.4.4 Prepare defect, failure, and equipment evaluation reports.

Standard 5: Evaluate systems and sub-systems. (1791.S.5)

Evaluate Systems and Sub-Systems Objectives
Students will:
1791.5.1 Identify input and output waveforms of various analog and digital sub-systems and systems.
1791.5.2 Illustrate input and output signals of various electronic power supplies and analog sub-systems.
1791.5.3 Use block diagrams of different kinds of systems and networks to describe the function of each block.
1791.5.4 Define and describe systems that operate in biomedical, communications, computer, and electromechanical networks.
1791.5.5 Obtain a signal output from a function generator and display this signal on an oscilloscope.
1791.5.6 Utilize electronic test instruments to observe and record input and output data of various electronic sub-systems, then write a technical report on the findings and determine if a system has a fault.
1791.5.7 Apply critical thinking skills to sub-system level troubleshooting of electronic power supplies and analog systems.
1791.5.8 Replace faulty sub-systems and test the overall systems for proper operation.
1791.5.9 Write reports on troubleshooting methods, providing steps taken to locate and replace faulty components and sub-systems.
1791.5.10 Construct sub-system assemblies to produce various electronics systems.
1791.5.11 Lay out electronic components with which to construct circuits and sub-systems.

Fundamentals of Electricity

This course will introduce students to the fundamental skills related to electricity. Students will become familiar with the use of meters and other equipment used in the field of electricity, and learn how to construct a variety of circuits.

Standard 1: Identify, explore/evaluate career opportunities related to electricity. (1793.S.1)

Electricity Objectives
Students will:
1793.1.1 Describe a variety of careers related to electricity, and the training necessary to be successful in those careers.
1793.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of electricity.
1793.1.3 Identify sources of information about careers in electricity.

Standard 2: Demonstrate knowledge of electrical safety. (1793.S.2)

Electrical Safety Objectives
Students will:
1793.2.1 Describe the effect of current on the human body.
1793.2.2 List general safety precautions when working with electricity.
1793.2.3 Identify various types of safety devices used with electricity.
1793.2.4 Describe typical electrical shock hazards in industry, and explain what to do for victims of electrical shock.
1793.2.5 List and describe the safe use of basic hand and power tools used in the field of electricity.

Standard 3: Interpret blueprints, schematics and technical orders. (1793.S.3)

Blueprint Objectives
Students will:
1793.3.1 Demonstrate knowledge of blueprint reading.
1793.3.2 Demonstrate knowledge of schematic reading.
1793.3.3 Explain the reasons for building plans and specifications.

Standard 4: Apply electrical math concepts. (1793.S.4)

Electrical Math Concepts Objectives
Students will:
1793.4.1 Demonstrate knowledge of Ohm's law and power formulas.
1793.4.2 Calculate branch circuit loads.

Standard 5: Demonstrate the proper use and care of electrical meters. (1793.S.5)

Electrical Meters Objective
Students will:
1793.5.1 Demonstrate the use and care of an ammeter, ohmmeter, and voltmeter.

Standard 6: Construct and analyze basic circuits. (1793.S.6)

Basic Circuits Objectives
Students will:
1793.6.1 Describe the electrical classification of conductors, insulators, and semi-conductors.

1793.6.2 Describe electrical current and differentiate between the different kinds of current.
1793.6.3 Define voltage, current, resistance, and power.
1793.6.4 List, and schematically represent the components that make up a basic electrical circuit.
1793.6.5 Connect dry cells into various series and parallel arrangements and measure and record voltage readings across each battery configuration.
1793.6.6 Conduct experiments that demonstrate the production of an electromotive force, obtaining voltage readings from experiments.
1793.6.7 Construct, solve and troubleshoot series, parallel and complex circuits.

Standard 7: Demonstrate proper techniques in making connections/wire splices. (1793.S.7)

Connections/Wire Splices Objectives
Students will:
1793.7.1 Properly remove insulation and make tap, pigtail and western union splices.
1793.7.2 Apply solderless terminals, wire nuts, and insulating tape to the ends of various sized wires.

Standard 8: Perform basic soldering techniques. (1793.S.8)

Soldering Objectives
Students will:
1793.8.1 Demonstrate proper use and care for soldering tools and equipment.
1793.8.2 Demonstrate correct stripping, tinning, and soldering procedures.
1793.8.3 Identify characteristics of a good solder connection.

Wiring and Soldering

This course will introduce students to the skills and technology involved in the wiring and soldering of modern components and circuit boards, etc.

Standard 1: Soldering techniques. (1795.S.1)

Soldering Techniques Objectives
Students will:

1795.1.1 Remove and replace components on printed circuit boards, repairing any damage to the boards.
1795.1.2 Identify and use heat sinks when soldering heat sensitive components to circuits boards.
1795.1.3 Prepare wires, terminals, components, and printed circuit boards for soldering.
1795.1.4 Solder wires and components to terminals and printed boards.
1795.1.5 Solder and desolder single sided boards, multilayered boards, and surface mounted devices.

Standard 2: Demonstrate proper procedures when handling, maintaining, and constructing printed circuit boards. (1795.S.2)

Circuit Boards Objectives
Students will:

1795.2.1 Use computer software to generate printed circuit board design.
1795.2.2 Lay out printed circuit boards for etching.
1795.2.3 Use different methods to produce printed circuit boards, including applying basic chemistry principles to produce printed circuits on copper-clad boards.
1795.2.4 Demonstrate proper safety procedures when working with P.C. boards.
1795.2.5 Use parts diagrams and schematics to properly place and solder components to printed circuit boards.
1795.2.6 Test completed circuit boards for proper circuit operation.

Basic Masonry and Landscaping

This course will introduce students to basic skills in masonry and landscape maintenance; including safety, and tools, equipment and processes.

Standard 1: Demonstrate knowledge of basic masonry skills. (1801.S.1)

Basic Masonry Skills Objectives
Students will:

1801.1.1 Identify and describe common terms, tools and equipment used in the masonry field.
1801.1.2 Demonstrate proper safety skills associated with masonry work.
1801.1.3 Repair various types of masonry surfaces using proper materials; including filling expansion joints, repairing structural cracks, installing fasteners, and replacing bricks and blocks.
1801.1.4 Construct forms for masonry repair.
1801.1.5 Mix, float, edge and joint concrete and mortar.
1801.1.6 Waterproof masonry wall.

Standard 2: Demonstrate knowledge of basic landscape maintenance skills. (1801.S.2)

Landscape Maintenance Skills Objectives
Students will:

1801.2.1 Identify and describe common terms, tools, equipment, and materials associated with lands maintenance.
1801.2.2 Demonstrate proper safety skills associated with land maintenance.
1801.2.3 Demonstrate proper methods to repair and maintain lawns, including fill, grade, seed, mow, edge and trim turf.
1801.2.4 Select and apply herbicides, pesticides, and fertilizers for landscape planting.
1801.2.5 Plant trees, shrubs, and flowers, and maintain them by pruning trees and shrubs and maintaining flowerbeds.
1801.2.6 Properly use tools and materials for removal of snow and ice.
1801.2.7 Perform maintenance on landscape tools and equipment.

Basic Plumbing and Electricity

This course will introduce students to basic skills in basic plumbing and electricity; including safety, and tools, equipment and processes.

Standard 1: Demonstrate knowledge of basic plumbing skills. (1803.S.1)

Basic Plumbing Skills Objectives
Students will:
1803.1.1 Identify terms, tools, materials and fixtures common to plumbing repair.
1803.1.2 Demonstrate proper safety skills associated with plumbing work.
1803.1.3 Measure, cut, join and apply fittings to galvanized, black iron, copper, and plastic pipe and tubing.
1803.1.4 Demonstrate the ability to open clogged lines, using chemicals, a plunger, and a snake or auger.
1803.1.5 Demonstrate ability to winterize water supply lines, traps and drains.

Standard 2: Demonstrate skills related to advanced plumbing repair. (1803.S.2)

Advanced Plumbing Repair Objectives
Students will:
1803.2.1 Perform tests to detect leaks on water pipes and repair leaking faucets and pipes.
1803.2.2 Clean gas furnace burner chamber and thermocouple, ventilate vapor from confined area and test for leaks.
1803.2.3 Properly maintain water heaters and furnaces, including: installation of pressure safety valve, adjustment of temperature, and lighting of pilot lights.

Standard 3: Demonstrate knowledge of basic electrical skills. (1803.S.3)

Basic Electrical Skills Objectives
Students will:
1803.3.1 Identify terms, tools, materials and fixtures common to electrical repair.
1803.3.2 Perform safety skills associated with electrical work.
1803.3.3 Replace defective electrical fixtures, such as: receptacles, switches, sockets, cords and plugs.
1803.3.4 Replace fluorescent and incandescent bulbs and fuses.
1803.3.5 Remove and replace faulty burners and oven heating elements in electric ranges.

Standard 4: Demonstrate skills related to advanced electrical maintenance. (1803.S.4)

Advanced Electrical Maintenance Objectives
Students will:
1803.4.1 Identify and explain the uses of basic electrical hardware items such as: switches, outlets, work boxes, and wiring.
1803.4.2 Test electrical circuits for power.
1803.4.3 Remove, replace, and adjust thermostats, and ballast and starters in fluorescent fixtures.

Fundamentals of Facilities Maintenance

This course will introduce students to the basic skills in preventive and corrective facilities maintenance. Students will become familiar with general basic tools, materials and processes necessary for facility and landscape maintenance.

Standard 1: Identify, explore, and evaluate career opportunities related to facilities maintenance. (1805.S.1)

Facilities Maintenance Objectives
Students will:
1805.1.1 Describe a variety of careers related to facilities maintenance, and the training necessary to be successful in those careers.
1805.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of facilities maintenance.
1805.1.3 Identify sources of information about careers in facilities maintenance.

Standard 2: Demonstrate knowledge of basic safety as it relates to maintaining facilities and landscapes. (1805.S.2)

Basic Safety Objectives
Students will:
1805.2.1 Recognize and follow general shop safety guidelines.
1805.2.3 Select and wear appropriate protective equipment.
1805.2.3 Demonstrate proper lifting techniques.
1805.2.4 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.
1805.2.5 Demonstrate proper use and handling of fundamental job related chemicals, including mixing, applying, storing and disposing of chemicals.
1805.2.6 Demonstrate the proper selection and use of fire extinguishers.

Standard 3: Demonstrate knowledge of basic blueprint reading. (1805.S.3)

Basic Blueprint Reading Objectives
Students will:
1805.3.1 Interpret scale drawings.
1805.3.2 Identify and define common architectural drawings symbols.
1805.3.3 Demonstrate knowledge of specifications and codes.

Standard 4: Demonstrate the ability to read and follow technical instructions. (1805.S.4)

Read and Follow Technical Instructions Objectives
Students will:
1805.4.1 Read and complete work orders.
1805.4.2 Read and follow technical instructions in manuals, texts, specifications and codes.

Standard 5: Demonstrate knowledge of basic carpentry skills. (1805.S.5)

Basic Carpentry Skills Objectives
Students will:
1805.5.1 Review proper use of a variety of common carpentry tools and equipment to measure, cut and fasten stock.
1805.5.2 Select appropriate carpentry materials for a specific job.

1805.5.3 Perform maintenance on carpentry tools.
1805.5.4 Construct simple wall, floor and roof frames.

Standard 6: Repair or refinish a variety of facility components. (1805.S.6)

Facility Components Objectives
Students will:
1805.6.1 Repair a variety of flooring, including repairing vinyl flooring and replacing ceramic floor tile.
1805.6.2 Remove and apply new finish to a variety of surfaces using multiple methods and materials.
1805.6.3 Properly prepare a wall and hang wallpaper.
1805.6.4 Repair window glass by removing glass, measuring and cutting new glass and installing and glazing new window.
1805.6.5 Remove and replace damaged window screen.
1805.6.6 Repair stair components by removing treads and risers, cutting a new stringer, and replacing treads and risers.
1805.6.7 Repair, replace hardware, and install doors.
1805.6.8 Properly cut angles and coped joints on molding and install trim, filling nail holes.

Standard 7: Demonstrate the ability to weatherize structures. (1805.S.7)

Weatherize Structures Objectives
Students will:
1805.7.1 Caulk windows and doors.
1805.7.2 Install weather stripping.

Standard 8: Maintain gutters and down spouts. (1805.S.8)

Gutters And Down Spouts Objectives
Students will:
1805.8.1 Join, level and apply caulk to gutters and down spouts.
1805.8.2 Clean gutters and down spouts and install leaf guards.

Forestry I

This area of study is designed to provide students with basic knowledge and skills in forestry and related occupations. Major instructional concepts included in this area of study are: safety principles in forestry, tree identification, forest protection, basic forest measurement and silvicultural practices.

Standard 1: Practice safety principles in forestry. (1811.S.1)

Forestry Objectives
Students will:
1811.1.1 Wear appropriate safety gear.
1811.1.2 Maintain a safe working environment.
1811.1.3 Identify safety hazards of fire line construction and mop-up.

Standard 2: Identify economic trees in West Virginia. (1811.S.2)

Trees in West Virginia Objectives
Students will:
1811.2.1 Identify the following trees:
Red Oak, White Ash, White Oak, Basswood, Chestnut Oak, Walnut, Black Oak, Hickory, Scarlet Oak, White Pine, Red Maple, Spruce, Sugar Maple, Hemlock, Black Cherry, Black Locust, Black Birch, Cucumber, Yellow Poplar, Virginia Pine
1811.2.2 Identify by leaves.
1811.2.3 Identify by bark.
1811.2.4 Identify by taste and smell.
1811.2.5 Identify by twigs.
1811.2.6 Identify by fruit.
1811.2.7 Explain tree morphology.

Standard 3: Demonstrate forest fire fighting procedures. (1801.S.3)

Forest Fire Fighting Procedures Objectives
Students will:
1811.3.1 Construct fire line using hand tools.
1811.3.2 Describe the proper use of fire rake, shovel, drip torch, Pulaski and backpack pump.
1811.3.3 Extinguish remaining fire spots after main fire is contained (mop-up).
1811.3.4 Determine direction for fire line construction.
1811.3.5 Repair and service equipment after fire is extinguished.
1811.3.6 Use backpack pump to fight fire directly.

Standard 4: Perform forest measurement techniques. (1801.S.4)

Forest Measurement Techniques Objectives
Students will:
1811.4.1 Set up instrument for surveying.
1811.4.2 Use compass to maintain direction.
1811.4.3 Make linear measurements using surveyor=s chain with compass.
1811.4.4 Make linear measurements by pacing with compass.
1811.4.5 Calculate the number of acres in a timber tract.
1811.4.6 Use hand/staff compass to determine bearing or Azimuth.
1811.4.7 Identify units of measurement (mile, rod, chain and acre).

Standard 5: Utilize silviculture treatment for timber stand improvement. (1811.S.5)

Silviculture Treatment Objectives
Students will:

1811.5.1 Determine major forest type and primary uses.
1811.5.2 Determine proper spacing using D+6 rule.
1811.5.3 Use increment borer to determine age and growth rate.
1811.5.4 Select and utilize pruning and thinning methods for a timber stand.
1811.5.5 Fell and limb trees.

Standard 6: Demonstrate laboratory investigations and hands-on learning.

Laboratory Investigations Objectives
Students will:

1811.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1811.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1811.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1811.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations and research.

Forestry II

Major instructional concepts included in this area of study are: leadership development, chainsaw operation and safety, timber cruising skills and integration of wildlife habitat management in forestry.

Standard 1: Utilize chainsaw safety. (1812.S.1)

Chainsaw Safety Objectives
Students will:
1812.1.1 Identify and use safety clothing and equipment.
1812.1.2 Use proper starting techniques.
1812.1.3 Identify proper safety rules with 100% accuracy.
1812.1.4 Identify and correct hazardous operational conditions.

Standard 2: Perform chainsaw maintenance. (1812.S.2)

Chainsaw Maintenance Objectives
Students will:
1812.2.1 Properly sharpen chain.
1812.2.2 Determine and adjust chain for proper tension.
1812.2.3 Demonstrate proper cleaning and storage of chainsaw.
1812.2.4 Replace sprocket on chainsaw.
1812.2.5 Replace bar on chainsaw.
1812.2.6 Replace broken chain link.
1812.2.7 Clean and service carburetor and air cleaner.
1812.2.8 Replace chain clutch as needed.
1812.2.9 Adjust carburetor for maximum efficiency.
1812.2.10 Mix fuel and oil in proper proportions.

Standard 3: Determine Volume of Standing Timber. (1812.S.3)

Standing Timber Objectives
Students will:
1812.3.1 Define and calculate board foot and cord wood volumes.
1812.3.2 Measure standing trees at diameter breast height using tree stick and diameter tape.
1812.3.3 Determine number of logs per tree using tree stick or clinometers.
1812.3.4 Record volume number of individual trees using tally sheet method.
1812.3.5 Calculate volume of saw logs using Doyle, Scribner and International 1/4" rule.
1812.3.6 Calculate volume of pulpwood by cords.

Standard 4: Perform wildlife habitat management. (1812.S.4)

Wildlife Habitat Management Objectives
Students will:
1812.4.1 Monitor and improve water quality.
1812.4.2 Improve habitat for bird, fish and game.
1812.4.3 Understand the importance of the forest, field and edge.
1812.4.4 Identify potential den and mast trees.

Standard 5: Perform laboratory investigations. (1812.S.5)

Laboratory Investigations Objectives

Students will:

1812.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1812.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1812.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1812.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Apply technology the forestry industry. (1812.S.6)

Forestry Industry Objectives

Students will:

1812.6.1 Use computers and the World Wide Web (WWW) to solve problems related to work-based experience programs in forestry, locate, evaluate, and collect information from a variety of sources related to forestry, develop positive attitudes toward technology that supports lifelong learning, collaboration, personal pursuits, and productivity.

1812.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1812.6.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1812.6.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry III

This area of study provides instructional concepts in the following areas: personal leadership development, advanced dendrology, safety training, operation and maintenance of forestry equipment and silvicultural applications.

Standard 1: Demonstrate personal leadership skills. (1813.S.1)

Personal Leadership Skills Objectives
Students will:
1813.1.1 Describe the parts of a good speech.
1813.1.2 Explain how to present a desirable speech.
1813.1.3 Correctly conduct research in topics concerning forestry.
1813.1.4 Deliver a speech on a forestry topic.

Standard 2: Perform advanced dendrology skills. (1813.S.2)

Dendrology Skills Objectives
Students will:
1813.2.1 Identify by flowers.
1813.2.2 Identify by growth characteristics.
1813.2.3 Identify by site conditions.
1813.2.4 Identify by distribution.

Standard 3: Perform forestry safety skills. (1813.S.3)

Forestry Safety Skills Objectives
Students will:
1813.3.1 Demonstrate safety with hand tools.
1813.3.2 Demonstrate safety with chainsaws.
1813.3.3 Demonstrate safety with tractors.
1813.3.4 Demonstrate safety on the fire line.

Standard 4: Operate and maintain forestry equipment. (1813.S.4)

Forestry Equipment Objectives
Students will:
1813.4.1 Demonstrate the proper use and maintenance of hand tools.
1813.4.2 Demonstrate the proper use and maintenance of chainsaws.
1813.4.3 Demonstrate the proper use and maintenance of tractors.
1813.4.4 Lubricate all grease fittings using proper grease at periodic intervals with appropriate equipment.

Standard 5: Apply silvicultural practices for timber stands. (1813.S.5)

Timber Stands Objectives
Students will:
1813.5.1 Demonstrate forest reproduction techniques.
1813.5.2 Demonstrate the technique of girdling in the process of removing undesirable trees.
1813.5.3 Define clear-cut.

Standard 6: Perform laboratory investigations. (1813.S.6)

Laboratory Investigations Objectives

Students will:

1813.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1813.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1813.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1813.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to the forestry industry. (1813.S.7)

Forestry Industry Objectives

Students will:

1813.7.1 Use computers and the World Wide Web (WWW).

1813.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1813.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1813.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry IV

Forestry IV provides instructional concepts in the following areas: parliamentary procedure, advanced leadership skills, safety in fire fighting, forest surveying and wood product utilization.

Standard 1: Demonstrate parliamentary procedure. (1814.S.1)

Parliamentary Procedure Objectives
Students will:
1814.1.1 Identify proper procedures for conducting a meeting.
1814.1.2 Write and present a committee report.
1814.1.3 Identify components of a program of activities.

Standard 2: Apply safety procedures of fire line construction. (1814.S.2)

Fire Line Construction Objectives
Students will:
1814.2.1 Explain fire line safety.
1814.2.2 Explain fire line construction.
1814.2.3 Explain forest fire mop-up.
1814.2.4 Explain the use of topographic maps in locating access roads and trails.
1814.2.5 Explain the use of topographic maps in fire location.
1814.2.6 Repair, service and store equipment.

Standard 3: Use forest surveying equipment. (1814.S.3)

Forest Surveying Equipment Objectives
Students will:
1814.3.1 Interpret surface features using aerial photography and topographic maps.
1814.3.2 Conduct a boundary survey using a hand compass and pacing.
1814.3.3 Visit a courthouse and conduct a title search.
1814.3.4 Plot bearings from deeds.
1814.3.5 Calculate percent slope using a clinometer.
1814.3.6 Orientate topographic map using hand compass.
1814.3.7 Utilize a GPS receiver to locate and mark points of reference.

Standard 4: Use best management practices in forest road construction. (1814.S.4)

Forest Road Construction Objectives
Students will:
1814.4.1 Lay out roads in compliance with West Virginia forest standards.
1814.4.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
1814.4.3 Explain the importance of installing culverts, water breaks and "woods" bridges.
1814.4.4 Design skid roads.
1814.4.5 Monitor water quality.
1814.4.6 Reseed skid trails and log landings.

Standard 5: Process, measure and market wood products. (1814.S.5)

Wood Products Objectives
Students will:
1814.5.1 Demonstrate competency in felling, bucking and skidding selected trees.

1814.5.2 Scale logs and lumber.
1814.5.3 Explore and explain various marketing opportunities for forest products.

Standard 6: Conduct laboratory investigations. (1814.S.6)

Laboratory Investigations Objectives
Students will:
1814.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1814.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1814.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1814.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to real world forestry problems. (1814.S.7)

Forestry Problems Objectives
Students will:
1814.7.1 Use computers and the World Wide Web (WWW) to solve problems, locate, evaluate, and collect information from a variety of sources, develop positive attitudes toward technology, personal pursuits, and productivity.
1814.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1814.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.
1814.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Forestry V

This course provides instruction in the following areas: forestry equipment use, timber cruising systems and application of best management practices to forestry.

Standard 1: Identify and use forestry equipment. (1815.S.1)

Forestry Equipment Objective
Students will:

1815.1.1 Identify and use the following: tree scale stick, increment bore, drip torch, fire rake, clinometers, hand compass, soil tube, jacobs staff, staff compass, chaps, hard hat/face, shield, pulaski, tree marking gun, wedge prism, stereoscope, log rule, data recorder, plastic flagging, chainsaw, ear protection, dot grid, and a dibble or tree planter.

Standard 2: Conduct a timber cruise. (1815.S.2)

Timber Cruise Objectives
Students will:

1815.2.1 Mark boundaries and corners of tract.
1815.2.2 Use compass to direct cruising operation.
1815.2.3 Measure distance between plot center (by pacing).
1815.2.4 Record trees using tally sheet method.
1815.2.5 Use wedge prism (BAF 10 or BAF 20).
1815.2.6 Calculate board foot volumes using double log scale.

Standard 3: Apply best management practices in a forestry setting. (1815.S.3)

Forestry Setting Objectives
Students will:

1815.3.1 Lay out roads in compliance with West Virginia forest standards.
1815.3.2 Describe maintenance procedures for drainage systems (culverts, ditches, etc.) in controlling soil erosion.
1815.3.3 Understand the importance of installing culverts, water breaks and "woods" bridges.
1815.3.4 Design skid roads.
1815.3.5 Demonstrate competency in felling, bucking and skidding selected trees.
1815.3.6 Scale logs and lumber.
1815.3.7 Monitor water quality.
1815.3.8 Reseed skid trails and log landings.

Standard 4: Conduct safe laboratory investigations. (1815.S.4)

Laboratory Investigations Objectives
Students will:

1815.4.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1815.4.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1815.4.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1815.4.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 5: Apply technology to forestry industry. (1815.S.5)

Forestry Industry Objectives

Students will:

1815.5.1 Use computers and the World Wide Web (WWW) to solve problems related to forestry, locate, evaluate, and collect information related to forestry, develop positive attitudes toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.

1815.5.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1815.5.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to forestry.

1815.5.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of forestry.

Standard 6: Demonstrate process/workplace skills used in forestry. (1815.S.6)

Process/Workplace Skills Objectives

Students will:

1815.6.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1815.6.2 Explore careers available in forestry.

1815.6.3 Use a variety of sources to investigate the educational requirements of various careers in forestry.

1815.6.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1815.6.5 Demonstrate correct language usage in all oral and written work.

1815.6.6 Perform effectively in both leadership and non-leadership roles.

1815.6.7 Evaluate information for reliability, completeness, and applicability to various assignments.

1815.6.8 Participate as a team member to complete a variety of assignments.

Outdoor Recreation

This area of study is designed to provide students with knowledge and skills in outdoor recreation that will be useful in various occupations in the field. Major emphasis will be on careers, public relations and teamwork.

Standard 1: Research career development in outdoor recreation. (1816.S.1)

Outdoor Recreation Objectives
Students will:
1816 .1.1 Identify regional career opportunities in outdoor recreation including, park ranger, recreation manager, instructor, conservation officer, first aid/safety expert, entertainment manager, business manager, outdoor guide, youth camp operator, campground owner, riding stable owner and lifeguard.
1816.1.2 Profile outdoor recreation specialists.
1816.1.3 Develop teamwork skills and activities.
1816..1.4 Develop public relation skills.

Standard 2: Participate in outdoor safety activities. (1816.S.2)

Outdoor Safety Activities Objectives
Students will:
1816.2.1 Obtain Red Cross first aid certificate.
1816.2.2 Obtain Red Cross adult CPR certificate.
1816.2.3 Identify potential outdoor safety hazards.
1816.2.4 Identify poisonous plants.
1816.2.5 Identify poisonous insects.
1816.2.6 Identify poisonous animals.
1816.2.7 Identify safety inspection procedures for outdoor recreation equipment.

Standard 3: Identify natural resource and recreation areas. (1816.S.3)

Natural Resource and Recreation Areas Objectives
Students will:
1816.3.1 Describe geological formations.
1816.3.2 Recognize services required for recreational areas.
1816.3.3 Recognize facilities required for recreational areas.
1816.3.4 Identify endangered species of plants and animals.
1816.3.5 Identify wetlands and riparian zones.
1816.3.6 Describe local, state and federal laws related to recreational enterprises.

Standard 4: Recognize business opportunities and promotions in outdoor recreation. (1816.S.4)

Business Opportunities and Promotions Objectives
Students will:
1816.4.1 Recognize income potential from various types of recreational enterprises.
1816.4.2 Identify business procedures required of recreational enterprises.
1816.4.3 Design advertising media to promote a recreational area effectively.

Standard 5: Safely conduct laboratory investigations. (1816.S.5)

Laboratory Investigations Objectives
Students will:

1816.5.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1816.5.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1816.5.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1816.5.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 6: Apply technology to real world problems. (1816.S.6)

Real World Objectives
Students will:
1816.6.1 Use computers and the World Wide Web (WWW) to solve problems related programs in outdoor recreation, locate, evaluate, and collect information from a variety of sources related to outdoor recreation, develop positive attitudes toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.
1816.6.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1816.6.3 Use cameras and/or camcorders to record activities and progress of special projects in the area of outdoor recreation.

Standard 7: Demonstrate process/work place skills used in outdoor recreation. (1816.S.7)

Process/Work Place Skills Objectives
Students will:
1816.7.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.
1816.7.2 Explore careers available in outdoor recreation.
1816.7.3 Use a variety of sources to investigate the educational requirements of various careers in biotechnology and related sciences.
1816.7.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.
1816.7.5 Demonstrate correct language usage in all oral and written work.
1816.7.6 Perform effectively in both leadership and non-leadership roles.
1816.7.7 Evaluate information for reliability, completeness, and applicability to various assignments.
1816.7.8 Participate as a team member to complete a variety of assignments.

Wildlife Management

This course provides instruction and training in leadership, history of fish and wildlife, wildlife management concepts, water and water quality, habitat management, life history and wildlife values as a natural resource.

Standard 1: Study the history of wildlife management. (1817.S.1)

History of Wildlife Management Objectives
Students will:
1817.1.1 Define and describe wildlife trends and their impact on management.
1817.1.2 Identify wildlife legalities and ethics.
1817.1.3 Define natural resources conservation.

Standard 2: Describe the concepts of wildlife management. (1817.S.2)

Concepts of Wildlife Management Objectives
Students will:
1817.2.1 Define succession stages related to wildlife management.
1817.2.2 Describe carrying capacity as related to wildlife.
1817.2.3 Define horizontal and vertical structuring.
1817.2.4 Explain ecological principles and their application to wildlife management.

Standard 3: Determine wildlife habitat management practices. (1817.S.3)

Wildlife Habitat Management Practices Objectives
Students will:
1817.3.1 Explain ecological principles applied to fish and wildlife.
1817.3.2 Design a wildlife management plan.
1817.3.3 Identify forest management practices for improving habitat.
1817.3.4 Identify agricultural management practices for improvement of habitat.
1817.3.5 Define and describe wetlands and their use.
1817.3.6 Identify government assistance available for habitat improvement.
1817.3.7 Construct and erect wildlife feeders/nest boxes.

Standard 4: Use technology to identify animal life histories. (1817.S.4)

Animal Life Histories Objectives
Students will:
1817.4.1 Identify life cycles of wildlife species.
1817.4.2 Describe interrelationship of wildlife species.
1817.4.3 Identify common relationships between humans and wildlife.
1817.4.4 Search the Internet to secure wildlife information.

Standard 5: Determine water and water quality relationships for conservation. (1817.S.5)

Water Quality Relationships Objectives
Students will:
1817.5.1 Identify sources of water and water pollutants.
1817.5.2 Explain the effects to water pollution on the ecosystem.
1817.5.3 Identify point and non-point source pollution and describe possible controls.
1817.5.4 Describe wetlands, their use, importance and preservation.
1817.5.5 Explain methods of protecting water sources.

Standard 6: Describe wildlife values as a resource to society. (1817.S.6)

Wildlife Values Objectives

Students will:

1817.6.1 Identify commercial value of fish and wildlife resources and economic benefit to people.
1817.6.2 Define recreational values of fish and wildlife.
1817.6.3 Describe social values of fish and wildlife.
1817.6.4 Identify esthetic values of fish and wildlife resources.
1817.6.5 Describe scientific and educational values of fish and wildlife.
1817.6.6 Evaluate negative impact of wild animals on humans.

Concrete Finishing

This course will apply the concepts, applications, and techniques necessary for various phases of concrete construction.

Standard 1: Understand concrete construction and finishing concepts. (1821.S.1)

Concrete Finishing Objectives
Students will:
1821.1.1 Define terms associated with concrete construction.
1821.1.2 Identify the composition and characteristics of concrete.
1821.1.3 Identify the uses of concrete as a building material.
1821.1.4 Identify the effect of craftsmanship on finished concrete.
1821.1.5 Explain the concrete construction process.
1821.1.6 Identify site operation work requirements.
1821.1.7 Explain the career potentials in concrete construction and finishing.

Standard 2: Understand and apply safety used in concrete construction. (1821.S.2)

Concrete Construction Objectives
Students will:
1821.2.1 Describe and wear different types of safety gear for the work site.
1821.2.2 State the guidelines for dressing appropriately for concrete work.
1821.2.3 Describe how to safely handle concrete when forming, placing, curing, and finishing.
1821.2.4 Describe safety precautions to follow when working in extreme heat and cold.
1821.2.5 Describe safety precautions to follow when working with hazardous materials.
1821.2.6 Describe proper procedures for handling and maintaining concrete construction tools safely.

Standard 3: Analyze the properties of concrete. (1821.S.3)

Properties of Concrete Objectives
Students will:
1821.3.1 Describe the properties of concrete.
1821.3.2 Explain how the properties of concrete are used in construction.
1821.3.3 Determine how the ingredients of concrete influence mix, placement, finishing, durability, and performance.
1821.3.4 Describe quality-control tests on concrete ingredients, fresh concrete, and hardened concrete.
1821.3.5 Mix a test batch of concrete.
1821.3.6 Perform a slump test.

Standard 4: Identify tools and equipment used in concrete construction. (1821.S.4)

Tools and Equipment Objectives
Students will:
1821.4.1 Name the tools used in placing and finishing concrete.
1821.4.2 Name the power equipment used in placing and finishing concrete.
1821.4.3 Describe how each tool is use.
1821.4.4 Describe how the power equipment is used.
1821.4.5 Associate trade terms with the appropriate tools and equipment.

Standard 5: Prepare worksite for concrete placement. (1821.S.5)

Worksite Objectives
Students will:
1821.5.1 Describe basic site layout using levels and measuring tools.
1821.5.2 Properly locate, grade, and build forms for horizontal placement.
1821.5.3 Perform compaction activities on subgrades.
1821.5.4 Describe various joints and where to locate them.
1821.5.5 Describe various reinforcements and how to place them.
1821.5.6 Describe information needed when ordering concrete.

Standard 6: Placing concrete. (1821.S.6)

Placing Concrete Objectives
Students will:
1821.6.1 Describe how concrete is conveyed and placed.
1821.6.2 Draw up a pre-placement checklist.
1821.6.3 Demonstrate the use of equipment and tools for placing concrete.
1821.6.4 Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form.
1821.6.5 Associate trade names with the appropriate processes and equipment.

Standard 7: Apply basic concrete finishing techniques. (1821.S.7)

Finishing Techniques Objectives
Students will:
1821.7.1 Describe the basic finishing process.
1821.7.2 Use the following finishing hand tool: float, edger, groover, and trowel.
1821.7.3 Mark and cut joints with a saw.
1821.7.4 Apply a broom finish.
1821.7.5 Apply a rubbing finish.
1821.7.6 Associate trade terms with the appropriate processes and equipment.

Standard 8: Curing and protecting concrete. (1821.S.8)

Curing and Protecting Objectives
Students will:
1821.8.1 Describe the process of curing concrete.
1821.8.2 Identify methods of curing concrete.
1821.8.3 Describe how each method is applied.
1821.8.4 Identify when each method is used.
1821.8.5 Associate trade terms with the appropriate processes and equipment.

Standard 9: Troubleshooting basic concrete construction problems. (1821.S.9)

Construction Problems Objectives
Students will:
1821.9.1 Describe a basic troubleshooting methodology that can be used to identify a variety of concrete construction problems and their causes.
1821.9.2 Identify problems with fresh concrete and describe ways to prevent them.
1821.9.3 Identify different concrete defects such as crazing, cracking, dusting, scaling, popouts, and efflorescence, and describe ways to prevent them.

Finishing Carpentry

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and installing interior and exterior wall, ceiling and floor coverings.

Standard 1: Estimate and install insulation and vapor barriers in walls, ceilings and floors. (1823.S.1)

Finish Carpentry Objectives
Students will:
1823.1.1 Install insulation in walls, ceiling, and floors.
1823.1.2 Explain the necessity for vapor barriers and properly install them.

Standard 2: Cover interior walls. (1823. S.2)

Interior Walls Objectives
Students will:
1823.2.1 Estimate and hang dry wall on interior walls and ceiling.
1823.2.2 Properly finish dry wall (nail holes, seams, corners).
1823.2.3 Prime and paint interior walls.
1823.2.4 Properly install paneling and appropriate trim.

Standard 3: Finish interior of a construction project. (1823.S.3)

Finish Interior Objectives
Students will:
1823.3.1 Install interior doors, door locksets, and windows.
1823.3.2 Cut and install baseboards, and door and window casings.
1823.3.3 Install various wall covering materials.
1823.3.4 Cut and install various floor coverings.
1823.3.5 Install cabinets.

Standard 4: Finish exterior of a construction project. (1823.S.4)

Finish Exterior Objectives
Students will:
1823.4.1 Estimate and install fascia and soffit on eaves and rake.
1823.4.2 Install attic ventilation.
1823.4.3 Properly install exterior siding.
1823.4.4 Paint exterior surfaces.

Foundations and Framing

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and constructing building foundations and rough framing.

Standard 1: Estimate and construct foundation. (1825.S.1)

Foundation Objectives
Students will:

1825.1 Use transit to turn and square corners, read and mark elevations and excavation lines and to set grade stakes.
1825.2 Estimate and install batter boards.
1825.3 Estimate and install foundation footer forms and expansion joints in preparation for concrete pour.
1825.4 Build stair forms for concrete steps.
1825.5 Estimate concrete yardage, pour and finish concrete.

Standard 2: Estimate and construct floor framing. (1825.S.2)

Floor Framing Objectives
Students will:

1825.2.1 Estimate, lay out and install a built up wood girder, termite protection, and sill plate.
1825.2.2 Estimate, lay out and install a floor frame, including: band boards, floor joists, cross bridging, openings and sub-floor.

Standard 3: Estimate and construct wall framing. (1825.S.3)

Wall Framing Objectives
Students will:

1825.3.1 Layout, erect and align exterior walls.
1825.3.2 Layout, erect and align interior partitions.
1825.3.3 Construct rough opening headers.
1825.3.4 Install second top plates to walls and partitions.
1825.3.5 Install backing for fixtures, cabinets, and bulkhead.
1825.3.6 Install sheathing on exterior walls.
1825.3.7 Install windows and doors in exterior wall rough openings.
1825.3.8 Layout and install ceiling joists.
1825.3.9 Cut and assemble stringers, risers, and treads for a basic set of stairs.

Standard 4: Estimate and construct roof framing. (1825.S.4)

Roof Framing Objectives
Students will:

1825.4.1 Layout, cut and install king posts and ridge boards.
1825.4.2 Layout, cut and install roof rafters.
1825.4.3 Layout, cut and install rough fascia, gable end studs, and collar beams.
1825.4.4 Install roof sheathing, drip edge, asphalt or fiberglass shingles, and ridge vents.

Fundamentals of Building Construction

This course will introduce students to basic knowledge of building plans and materials and safe work habits used in general building construction occupations.

Standard 1: Identify, explore, and evaluate career opportunities related to building construction. (1827.S.1)

Career Opportunities Objectives
Students will:
1827.1.1 Describe a variety of careers related to building construction, and the training necessary to be successful in those careers.
1827.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of building construction.
1827.1.3 Identify sources of information about careers in building construction.

Standard 2: Identify and demonstrate proper personal safety practices. (1827.S.2)

Safety Practices Objectives
Students will:
1827.2.1 Review and follow general construction safety guidelines.
1827.2.2 Demonstrate proper lifting techniques.
1827.2.3 Identify and demonstrate proper use and care of all basic personal safety equipment including hearing and eye protection, hard hats and shoes.

Standard 3: Identify basic hand tools and demonstrate safe and appropriate use. (1827.S.3)

Hand Tools Objectives
Students will:
1827.3.1 Choose the proper hand tools for given applications, and describe the proper care and maintenance of each.
1827.3.2 Demonstrate adjustments possible with each tool.

Standard 4: Identify basic power tools (portable and stationary) and demonstrate safe and appropriate use. (1827.S.4)

Power Tools Objectives
Students will:
1827.4.1 Choose proper power tool for a given application.
1827.4.2 Recognize and identify appropriate blade or bit for given situation, and demonstrate the ability to change blades and bits on cutting tools.
1827.4.3 Demonstrate possible adjustments to power tools.
1827.4.4 Describe proper care and maintenance of power tools and machinery.

Standard 5: Demonstrate proper and safe use of ladders and scaffolds. (1827.S.5)

Ladders and Scaffolds Objective
Students will:
1827.5.1 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.

Standard 6: Demonstrate the ability to interpret blueprints. (1827.S.6)

Blueprints Objectives

Students will:

1827.6.1 Review the basic information found in foundation and floor plans, including dimensions, symbols and scale.

1827.6.2 Prepare a written cost estimate for a construction project.

1827.6.3 Identify information on window and door schedules.

1827.6.4 Interpret blueprints for plumbing and wiring specifications.

1827.6.5 Determine fixtures needed for a construction project.

Standard 7: Identify and properly use a variety of framing materials. (1827.S.7)

Framing Materials Objectives

Students will:

1827.7.1 Identify basic framing materials, including solid lumber, plywood, and various fasteners.

1827.7.2 Perform various forming, separating, and combining processes on construction materials.

Masonry and Plumbing

This course will introduce students to safe, efficient and acceptable practices involved in estimating for and constructing masonry and plumbing systems.

Standard 1: Estimate, layout and prepare masonry materials for a foundation. (1829.S.1)

Foundation Objectives
Students will:
1829.1.1 Demonstrate safe work habits while working with masonry materials and equipment.
1829.1.2 Lay out and square a foundation using a transit and the 6-8-10 method.
1829.1.3 Discuss the size of footings for various widths of block, and pour a footer.
1829.1.4 Properly mix and spread mortar, build corners and foundation, install stretcher blocks and sill anchors.
1829.1.5 Properly install waterproofing and ventilation in a foundation.

Standard 2: Rough in a plumbing drain system. (1829.S.2)

Plumbing Drain System Objectives
Students will:
1829.2.1 Install drain lines according to code.
1829.2.2 Cut copper and plastic tubing for water supply.
1829.2.3 Apply appropriate fittings and fastening techniques to copper and plastic tubing.

Standard 3: Install finishing plumbing. (1829.S.3)

Finishing Plumbing Objectives
Students will:
1829.3.1 Properly install various plumbing fixtures (commode, lavatory, bath tub and/or shower).
1829.3.2 Install shut-off valves, faucets and screw-on fittings.
1829.3.3 Install hot water tank.

Basic Darkroom Procedures

This course will introduce students to the basic fundamentals of darkroom procedures, photographing and developing line and halftone negatives, and process color printing.

Standard 1: Demonstrate proper darkroom procedures. (1831.S.1)

Darkroom Procedures Objectives
Students will:
1831.1.1 Identify different types of process cameras, and list the basic parts of the camera.
1831.1.2 Identify and prepare film developing trays.
1831.1.3 Identify various safe lights and select proper safelight for different films.
1831.1.4 Determine base and emulsion sides of film.
1831.1.5 Name three (3) methods of developing film.
1831.1.6 Select best F-stop, temperature and percentage for developing film.

Standard 2: Demonstrate safe work habits while working with graphic arts materials and equipment. (1831.S.2)

Safe Work Habits Objectives
Students will:
1831.2.1 Identify and practice safety rules used in the darkroom.
1831.2.2 Describe safe use and disposal of toxic and/or flammable substances and chemicals.

Standard 3: Demonstrate the ability to photograph and develop line negatives. (1831.S.3)

Line Negatives Objectives
Students will:
1831.3.1 Identify various types of film used in a process camera, and handle film properly.
1831.3.2 Describe camera operator's sensitivity guide.
1831.3.3 Prepare camera for basic exposure.
1831.3.4 Produce and evaluate line negatives.

Standard 4: Produce halftone negatives. (1831.S.4)

Halftone Negatives Objectives
Students will:
1831.4.1 Compute main and flash exposures.
1831.4.2 Describe the proper care of contact screens.
1831.4.3 Expose and develop a halftone negative.
1831.4.4 Identify three (3) areas of halftone negatives.
1831.4.5 List three (3) exposures for halftone negatives.
1831.4.6 Identify and evaluate halftone dots.
1831.4.7 Describe a duotone.

Standard 5: Identify the basic principles of process color printing. (1831.S.5)

Color Printing Objectives
Students will:
1831.5.1 Describe flat and process color printing.
1831.5.2 Describe the difference between additive and subtractive colors, and name the four process color inks.
1831.5.3 List two methods of process color separation.

1831.5.4 Identify proper filters for process color negatives.
1831.5.5 Describe screen angle for process color negatives.
1831.5.6 Select proper film for process color separations.
1831.5.7 Identify color separation negatives.

Electronic Imaging

This course will introduce students to desktop publishing, including basic typesetting, image designs, proofreading, and computer scanning operations.

Standard 1: Perform basic typesetting procedures in desktop publishing images. (1833.S.1)

Typesetting Procedures Objectives
Students will:
1833.1.1 Identify and describe basic desktop publishing tools, equipment, and materials.
1833.1.2 Identify and properly use desktop publishing menus, toolboxes, and options.
1833.1.3 Design proper page layout and size, indicating guidelines, fold lines, and margins.
1833.1.4 Select font and point sizes.
1833.1.5 Perform copy fitting techniques.
1833.1.6 Setup printer for copy and make a print.

Standard 2: Identify appropriate proofreading knowledge and use. (1833.S.2)

Proofreading Objectives
Students will:
1833.2.1 Identify proofreading marks.
1833.2.2 Make corrections on galley proofs.
1833.2.3 Perform proper proofreading techniques by marking up copy for production of a printed piece.

Standard 3: Perform scanning operations. (1833.S.3)

Scanning Operations Objectives
Students will:
1833.3.1 Identify scanner hardware and software and describe its basic components, operations and limitations.
1833.3.2 Demonstrate appropriate scanner/program operations for line and continuous tone work.
1833.3.3 Place scanned graphics and /or photos into existing page layouts.

Standard 4: Operate digital cameras and software available for digital printing. (1833.S.4)

Digital Printing Objectives
Students will:
1833.4.1 Identify features of different types of digital cameras and printing equipment.
1833.4.2 Take pictures and transfer images to the computer using different types of digital cameras.
1833.4.3 Manipulate and organize images transferred from digital cameras.
1833.4.4 Utilize digital printing processes.

Fundamentals of Graphic Design and Production

This course will introduce students to the basic fundamentals of the graphic communications industry. Students will become familiar with safety in the graphic arts lab and basic techniques in drawing and illustration.

Standard 1: Demonstrate knowledge of career opportunities in graphic design and production. (1835.S.1)

Career Opportunities Objectives
Students will:
1835.1.1 Describe a variety of careers related to graphic design and production, and the training necessary to be successful in those careers.
1835.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of graphic design and production.
1835.1.3 Identify sources of information about careers in graphic design and production.

Standard 2: Identify a variety of basic graphic design equipment and materials. (1835.S.2)

Equipment and Materials Objectives
Students will:
1835.2.1 Identify and describe a variety of major printing processes.
1835.2.2 Name types of materials on which printing is done.
1835.2.3 Identify basic tools used in the graphic arts lab.

Standard 3: Demonstrate safe work habits in the graphic arts lab. (1835.S.3)

Safe Work Habits Objectives
Students will:
1835.3.1 Demonstrate job-related safety precautions and procedures regarding use of materials and equipment in the graphic arts lab.
1835.3.2 Describe proper precautions when handling toxic or flammable chemicals.

Standard 4: Identify legal restrictions regarding copy limitations. (1835.S.4)

Copy Limitations Objectives
Students will:
1835.4.1 Name three (3) elements of a copyright notice.
1835.4.2 Identify items that may and may not be copyrighted, and describe procedures to obtain permission to reproduce copyrighted materials.

Standard 5: Introduce design elements and principles to graphic applications. (1835.S.5)

Graphic Applications Objectives
Students will:
1835.5.1 Incorporate the design principles of balance, eye travel, contrast, repetition, focal point, and unity when developing illustrations.
1835.5.2 Differentiate between line, value, texture, depth, color, shape and rhythm.
1835.5.3 Using desktop publishing software, develop a three-panel brochure using appropriate layout, type, and clip art.

Standard 6: Demonstrate the principles of job planning and layout when producing layouts to customer specifications. (1835.S.6)

Customer Specifications Objectives

Students will:

1835.6.l Identify the elements for layouts, including: headline, subhead, copy-block, illustrations/photos, negative space, etc.

1835.6.2 Produce thumbnail sketches that reflect client expectations.

1835.6.3 Apply the inch/point/pica scales during layout through the mechanical preparation process.

1835.6.4 Identify and apply a variety of font styles, typefaces, and hand lettering.

1835.6.5 Incorporate hand and computer generated artwork and screen tints into layouts.

1835.6.6 Use a variety of layout tools, including: compasses, triangles, t-squares, templates, and French curves into layout and finished art preparation processes.

1835.6.7 Develop rough layouts.

1835.6.8 Choose paper stock, other medium, and ink colors for layouts.

1835.6.9 Develop a comprehensive layout, both hand and computer generated.

Graphic Communications

This course will introduce students to diffusion transfer principles, electrostatic platemaking, offset troubleshooting, multicolor press operations, advanced darkroom and developing procedures and preparations, and job ticket orders.

Standard 1: Demonstrate knowledge of diffusion transfer principles. (1837.S.1)

Diffusion Transfer Principles Objectives
Students will:
1837.1.1 Identify basic diffusion transfer processing equipment and materials for making line prints.
1837.1.2 Make a diffusion transfer halftone print.

Standard 2: Identify and produce an electrostatic plate. (1837.S.2)

Electrostatic Plate Objectives
Students will:
1837.2.1 Identify electrostatic platemaking materials and equipment.
1837.2.2 Prepare, process and evaluate an electrostatic plate.

Standard 3: Perform basic offset troubleshooting and preventive maintenance. (1837.S.3)

Maintenance Objectives
Students will:
1837.3.1 List conditions associated with paper stock feeding problems, adjust double-sheet detector, pile height, and pull-out rollers, and adjust feeder system for various paper weights.
1837.3.2 Change blanket and dampening roller covers.
1837.3.3 Deglaze press ink rollers.
1837.3.4 Adjust plate to blanket pressure and blanket to impressive cylinder pressure.
1837.3.5 Adjust dampening roller and press ink form roller pressure.
1837.3.6 Check press for register.
1837.3.7 Perform monthly lubrication routine.
1837.3.8 Check feed roller pressure.

Standard 4: Perform basic press operation to produce multicolor printed material. (1837.S.4)

Basic Press Operation Objectives
Students will:
1837.4.1 Print a duotone and a four-color process job.
1837.4.2 Perform basic press wash-up procedures.
1837.4.3 Print a multicolor job two-sided.
1837.4.4 Identify printed order of process color inks.
1837.4.5 Identify ink-water problems.

Standard 5: Demonstrate advanced darkroom and film developing procedures. (1837.S.5)

Darkroom and Film Developing Procedures Objectives
Students will:
1837.5.1 Describe standard exposure tests for line photography.
1837.5.2 Conduct exposure tests for contact screens.
1837.5.3 Select proper filter for color separation negatives.
1837.5.4 Identify and calculate exposures for color separation negatives.
1837.5.5 Set exposure computer for halftone density range for highlight and shadow areas.

1837.5.6 Describe a bump exposure.

Standard 6: Calculate and prepare job ticket orders. (1837.S.6)

Job Ticket Orders Objectives
Students will:
1837.6.1 Describe the production work-flow of a job.
1837.6.2 Prepare a production information job ticket/jacket.
1837.6.3 Determine the most feasible method of production and calculate production costs.

Image Assembly and Platemaking

This course will introduce students to the fundamentals of image assembly and platemaking, including: film masking, platemaking, principles of offset platemaking, and copy paste-up principles and procedures.

Standard 1: Perform copy paste-up principles and procedures. (1839.S.1)

Copy Paste-Up Objectives
Students will:
1839.1.1 Identify various types of camera copy.
1839.1.2 Identify and properly use a variety of paste-up tools, materials and equipment.
1839.1.3 Calculate reductions and enlargements.
1839.1.4 Indicate guidelines on a paste-up, and center copy.
1839.1.5 Crop photographs.
1839.1.6 Describe screen tints.
1839.1.7 Identify a combination paste-up.
1839.1.8 Prepare a complete layout for camera-ready copy.

Standard 2: Demonstrate knowledge of film masking and assembly by properly preparing a flat. (1839.S.2)

Preparing a Flat Objectives
Students will:
1839.2.1 Identify basic tools, materials and equipment used in film masking.
1839.2.2 Identify parts of a flat.
1839.2.3 Position and tape both line and halftone negatives to masking sheet, then cut windows in flat.
1839.2.4 Prepare an un-ruled masking sheet.
1839.2.5 Prepare and opaque negatives.
1839.2.6 Identify register marks.
1839.2.7 Prepare flats for a step-and-repeat exposure and a double-burn exposure.
1839.2.8 Select appropriate screen tint and percentage.

Standard 3: Perform the basic techniques and principles of offset platemaking. (1839.S.3)

Platemaking Objectives
Students will:
1839.3.1 Identify various types of plate ends.
1839.3.2 Identify the basic areas of an offset plate.
1839.3.3 List types of plate materials, and describe their proper care.
1839.3.4 Identify plate exposure equipment and determine the correct plate exposure for a given situation.
1839.3.5 Describe a ten-step exposure guide.
1839.3.6 Expose a step-and-repeat plate and a double-burn plate.
1839.3.7 Develop a plate using a two-step method.
1839.3.8 Develop a subtractive plate.
1839.3.9 Prepare gum-arabic solution, gum and store plates.
1839.3.10 Describe a pin register system.

Offset Press and Binding Process

This course will introduce students to the fundamentals of operating an offset press, knowledge of papers, and cutting and binding operations.

Standard 1: Demonstrate knowledge of offset press fundamentals. (1841.S.1)

Offset Press Objectives
Students will:
1841.1.1 Explain the principle behind offset printing.
1841.1.2 Identify the basic systems of a sheet-fed press.
1841.1.3 Determine pH of fountain solution and properly mix fountain solution.
1841.1.4 List basic press operation and wash-up procedures.

Standard 2: Identify components of typical offset press system. (1841.S.2)

Components of Offset Press Objectives
Students will:
1841.2.1 Name the three main cylinders of an offset press.
1841.2.2 Identify components of the inking system, dampening system, feeder system, register board, and delivery system.
1841.2.3 Identify operator control features.

Standard 3: Operate an offset press. (1841.S.3)

Operate Offset Press Objectives
Students will:
1841.3.1 Read production information on job ticket.
1841.3.2 Describe and perform proper safety precautions during press operations.
1841.3.3 Prepare fountain concentrate and dampening system.
1841.3.4 Select color of ink and prepare the inking system.
1841.3.5 Install offset plate.
1841.3.6 Setup feeder system.
1841.3.7 Select proper paper size and weight.
1841.3.8 Prepare register board and paper delivery system.
1841.3.9 Print a single color job.
1841.3.10 Print a job on NCR stock.
1841.3.11 Print a multicolor job.
1841.3.12 Print a job work and tumble.
1841.3.13 Print a job work and turn.
1841.3.14 Setup and print a job on cover stock.
1841.3.15 Perform press wash-up procedures.
1841.3.16 Adjust night latch.
1841.3.17 Setup and print envelopes.

Standard 4: Identify and demonstrate knowledge of papers used in the printing industry. (1841.S.4)

Paper Objectives
Students will:
1841.4.1 Define common paper terms.
1841.4.2 Identify a watermark.
1841.4.3 Identify and describe the two sides of a sheet.

1841.4.4 Test for grain direction of paper stock.
1841.4.5 Identify various kinds of paper and match kinds of paper with their use.
1841.4.6 Select standard weights for various kinds of paper.

Standard 5: Calculate and perform paper-cutting operations. (1841.S.5)

Paper-cutting Operations Objectives
Students will:
1841.5.1 Read production information on job ticket.
1841.5.2 Calculate number of cuts from stock, identifying combination cuts.
1841.5.3 Describe and perform proper safety precautions during paper cutting operations.

Standard 6: Identify and perform bindery operations. (1841.S.6)

Bindery Operations Objectives
Students will:
1841.6.1 List operations performed in the bindery areas.
1841.6.2 Name two (2) types of stitches.
1841.6.3 Pad # 20 paper stock and carbonless paper stock.
1841.6.4 Drill stock for 3-ring binders.
1841.6.5 Perform spiral binding operations.
1841.6.6 Perform folding operations.
1841.6.7 Gather and collate a multi-page booklet.

Basic Illustration

This course will introduce students to the basic fundamentals of safety, design elements, medium and art tool exploration, perspective, shading techniques, and various printing methods.

Standard 1: Demonstrate safe work habits in the commercial art studio. (1851.S.1)

Safe Work Habits Objectives
Students will:
18511.1 Properly and safely use a variety of cutting tools (cutting board, Xacto knife, scissors, etc.).
18511.2 Properly and safely use toxic and/or flammable substances (permanent markers, rubber cement, fixative, etc.).

Standard 2: Execute a variety of media applications. (1851.S.2)

Media Applications Objectives
Students will:
1851.2.1 Apply line, value, texture, depth, color, shape and rhythm to designs.
1851.2.2 Draw using pen and ink.
1851.2.3 Draw using marker.
1851.2.4 Draw using various graphite and colored pencils.
1851.2.5 Draw using charcoal/pastels.
1851.2.6 Illustrate using a variety of paints: watercolor, oil, tempera, etc.

Standard 3: Draw using various perspective methods. (1851.S.3)

Draw Objectives
Students will:
1851.3.1 Draw using one-point, two-point, and three-point perspective at various eye levels.
1851.3.2 Draw using elliptical perspective horizontally and vertically, at various eye levels.
1851.3.3 Draw cast shadows using perspective techniques.

Standard 4: Draw and paint using various techniques. (1851.S.4)

Draw and Paint Objectives
Students will:
1851.4.1 Draw using soft pencil pressure techniques.
1851.4.2 Draw using pointillism/ stippling techniques.
1851.4.3 Draw using wash techniques.
1851.4.4 Draw using crosshatching techniques.
1851.4.5 Draw using airbrush techniques.

Standard 5: Explore various printing methods. (1851.S.5)

Printing Objectives
Students will:
1851.5.1 Create various relief prints using different media (cardboard, woodcuts, embossing, etc.)
1851.5.2 Create a screen print.

Computer Graphics

This course encompasses more advanced vector graphics software applications and faster graphic software applications.

Standard 1: Demonstrate proficiency with prepress concepts and graphic design production skills. (1853.S.1)

Production Skills Objectives
Students will:

1853.1.1 Incorporate photography into graphic design using 35 mm and /or digital photographic techniques.
1853.1.2 Scan and import images into graphic designs.
1853.1.3 Experiment with various input devices (keyboard, mouse, light pen, digitizing tablet).
1853.1.4 Develop awareness of Optical Character Recognition, external storage devices (Zip, Jazz drives, etc.), PDF format, and Pre-Flight software.
1853.1.5 Demonstrate understanding of the necessity for trapping.
1853.1.6 Produce and print out color separations for both spot and process color (CMVK) design projects.

Standard 2: Demonstrate your design proficiency through various advance design projects. (1853.S.2)

Design Projects Objectives
Students will:

1853.2.1 Layout a sign, design a billboard layout, design a logo and prepare it for reproduction
1853.2.2 Convert numerical data to effective visual representations: pie graphs, bar graphs, line graphs, etc.
1853.2.3 Develop a decorative design, such as borders, wallpaper design, wrapping paper design, etc.
1853.2.4 Layout/construct a package design and prepare for printing.
1853.2.5 Design/construct point-of-purchase display (easel); prepare for printing.
1853.2.6 Retouch photographs using imaging software (i.e., PhotoShop, PhotoPAINT, etc.).
1853.2.7 Use merge imaging software.

Standard 3: Solve a variety of complex graphic problems and prepare each design for reproduction. (1853.S.3)

Graphic Problems Objective
Students will:

1853.3.1 Design a multi-page printed piece that incorporates signatures and conforms to printing limitations.

Standard 4: Explore various intermediate processes used in design production. (1853.S.4)

Intermediate Processes Objectives
Students will:

1853.4.1 Operate a camera using various accessory equipment: lenses, tripods, cable release, strobe/flash, etc.
1853.4.2 Select film based on an understanding of how ASA relates to printed image, grain, light, etc.
1853.4.3 Apply depth of field, focus, competition, exposure, (spot and average metering), aperture/ shutter speed relationship to photographic assignments.
1853.4.4 Operate enlarger incorporating dodging and burning techniques.
1853.4.5 Mix chemistries for black and white photographic development per product instructions.

1853.4.6 Paint, fix and dry prints per product instructions.
1853.4.7 Layout a design and print it using silk-screen techniques (hand-cut or photographic).
1853.4.8 Disassemble and assemble airbrush.
1853.4.9 Set compressor gauges to proper pressure.
1853.4.10 Prepare media for airbrush (ink, watercolor, oil-based paint, etc.)
1853.4.11 Experiment with various frisketing methods: prepared, liquid, etc.
1853.4.12 Render a drawing/painting or retouch a photograph with airbrush.

Standard 5: Develop a portfolio with which to seek employment (or college acceptance) in the field of commercial art. (1853.S.5)

Portfolio Objectives
Students will:
1853.5.1 Complete the development of the portfolio started in previous course.
1853.5.2 Write a resume and a letter of introduction to accompany the portfolio.
1853.5.3 Complete a job application that references the portfolio.
1853.5.4 Participate in a real or a mock job interview.

Standard 6: Operate digital cameras. (1853.S.6)

Digital Cameras Objectives
Students will:
1853.6.1 Identify features of different types of digital cameras.
1853.6.2 Take pictures and transfer images to the computer using different types of digital cameras.
1853.6.3 Manipulate and organize images transferred from digital cameras.

Standard 7: Create animations using available software. (1853.S.7)

Animations Objectives
Students will:
1853.7.1 Identify animation software.
1853.7.2 Place images to create animations.
1853.7.3 Create frames from images to animate.
1853.7.4 Create and enhance multimedia animations.

Desktop Publishing

This course emphasizes page layout and desktop publishing skills using programs such as Adobe Pagemaker, Quark Express, or Corel Ventura.

Standard 1: Demonstrate proficiency with prepress concepts and graphic design production skills.
(1855.S.1)

Productions Skills Objectives
Students will:
1855.1.1 Format text (apply style, point size, leading, alignment, tabs, indents etc.).
1855.1.2 Scan and import illustrative and photographic images.
1855.1.3 Output layouts and color separations using inkjet and laser printers.
1855.1.4 Understand the advantages of Postscript Level III output.

Standard 2: Design a variety of page layout projects. (1855.S.2)

Page Layout Objectives
Students will:
1855.2.1 Design a newspaper ad and prepare it for reproduction.
1855.2.2 Design a magazine ad and prepare it for printing.
1855.2.3 Design a multi-panel brochure.
1855.2.4 Design a multi-page printed piece that incorporates signatures and conforms to printing limitations.
1855.2.5 Design a masthead and prepare a 4-page newsletter for reproduction.
1855.2.6 Import text originating from a word processing program.

Standard 3: Complete the development of a portfolio for the purpose of seeking employment (or college acceptance) in the field of commercial art/graphic design. (1855.S.3)

Portfolio Objectives
Students will:
1855.3.1 Complete development of a portfolio.
1855.3.2 Write a resume and a letter of introduction to accompany the portfolio.
1855.3.3 Complete a job application that references the portfolio.
1855.3.4 Participate in a real or a mock job interview.

Fundamentals of Graphic Design and Production

This course will introduce students to the basic fundamentals of the graphic communications industry. Students will become familiar with safety in the graphic arts lab and basic techniques in drawing and illustration.

Standard 1: Demonstrate knowledge of career opportunities in graphic design and production. (1857.S.1)

Career Opportunities Objectives
Students will:
1857.1.1 Describe a variety of careers related to graphic design and production, and the training necessary to be successful in those careers.
1857.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of graphic design and production.
1857.1.3 Identify sources of information about careers in graphic design and production.

Standard 2: Identify a variety of basic graphic design equipment and materials. (1857.S.2)

Equipment and Materials Objectives
Students will:
1857.2.1 Identify and describe a variety of major printing processes.
1857.2.2 Name types of materials on which printing is done.
1857.2.3 Identify basic tools used in the graphic arts lab.

Standard 3: Demonstrate safe work habits in the graphic arts lab. (1857.S.3)

Safe Work Habits Objectives
Students will:
1857.3.1 Demonstrate job-related safety precautions and procedures regarding use of materials and equipment in the graphic arts lab.
1857.3.2 Describe proper precautions when handling toxic or flammable chemicals.

Standard 4: Identify legal restrictions regarding copy limitations. (1857.S.4)

Copy Limitations Objectives
Students will:
1857.4.1 Name three (3) elements of a copyright notice.
1857.4.2 Identify items that may and may not be copyrighted, and describe procedures to obtain permission to reproduce copyrighted materials.

Standard 5: Introduce design elements and principles to graphic applications. (1857.S.5)

Graphic Applications Objectives
Students will:
1857.5.1 Incorporate the design principles of balance, eye travel, contrast, repetition, focal point, and unity when developing illustrations.
1857.5.2 Differentiate between line, value, texture, depth, color, shape and rhythm.
1857.5.3 Using desktop publishing software, develop a three panel brochure using appropriate layout, type, and clip art.

Standard 6: Demonstrate the principles of job planning and layout when producing layouts to customer specifications. (1857.S.6)

Customer Specifications Objectives

Students will:

1857.6.1 Identify the elements for layouts, including: headline, subhead, copy-block, illustrations/photos, negative space, etc.

1857.6.2 Produce thumbnail sketches that reflect client expectations.

1857.6.3 Apply the inch/point/pica scales during layout through the mechanical preparation process.

1857.6.4 Identify and apply a variety of font styles, typefaces, and hand lettering.

1857.6.5 Incorporate hand and computer generated artwork and screen tints into layouts.

1857.6.6 Use a variety of layout tools, including: compasses, triangles, t-squares, templates, and French curves into layout and finished art preparation processes.

1857.6.7 Develop rough layouts.

1857.6.8 Choose paper stock, other medium, and ink colors for layouts.

1857.6.9 Develop a comprehensive layout, both hand and computer generated.

Graphic Design

This course will introduce students to basic advertising concepts, and hand and computer generated layout procedures and paste-up/mechanical production.

Standard 1: Establish demographics for various target markets and develop market research skills. (1859.S.1)

Establish demographics for various target markets and develop market research skills objectives.
The student will:

1859.1.1 Make graphic design decisions regarding type, style, color and illustrative choices based on data such as age, sex, education level and occupation.

1859.1.2 Study client, product/service that is being promoted, potential customer and purpose of document being designed.

Standard 2: Execute correct hand generated paste-up/mechanical preparation skills. (1859.S.2)

Execute correct hand generated paste-up/mechanical preparation skills objectives.
The student will:

1859.2.1 Secure all elements for Paste-up/mechanical/camera-ready art/keyline.

1859.2.2 Scale art using grids, transfers, projections, and proportion wheels. Cut amberlith/rubylith for overlay color separation.

1859.2.3 Execute finished art for spot color printing.

1859.2.4 Specify type/mark up all copy.

1859.2.5 Set type via desktop publishing software program that conforms to industry standards (Pagemaker, Quark Express, etc.).

1859.2.6 Crop, size (scale), and key photographs.

1859.2.7 Assemble mechanical/camera-ready art for 1, 2, and 3 color spot color designs.

1859.2.8 Indicate appropriate printer/camera instructions on mechanical: trim marks, fold lines, register marks, inks and percentages, bleeds, die cuts, foil stamping, spot varnish, embossing, etc.

Standard 3: Use vector graphics software to properly execute a variety of computer generated design projects. (1859.S.3)

Use vector graphics software to properly execute a variety of computer generated design projects objectives.
The student will:

1859.3.1 Incorporate logo design into letterheads, envelopes, business cards, etc., for the purposes of corporate identity.

1859.3.2 Design a greeting card and prepare for printing.

1859.3.3 Draw cartoons/caricatures.

1859.3.4 Produce a story board for a TV ad, motion picture, video, etc.

Illustration

This course will introduce students to the fundamentals of color theory and figure drawing.

Standard 1: Apply color theory to illustrations. (1861.S.1)

Illustrations Objectives
Students will:
1861.1.1 Identify the components of the color wheel, i.e., primary, secondary, and tertiary, etc.
1861.1.2 Determine color combinations: complimentary, analogous, split-complimentary, triads, tetrads, etc. and use them in designs.
1861.1.3 Define the dimensions of color: hue, value, intensity, opacity, saturation.

Standard 2: Apply rules of proportion to figure drawing. (1861.S.2)

Figure Drawing Objectives
Students will:
1861.2.1 Produce renderings of both standard and fashion figures.
1861.2.2 Produce renderings of heads, faces, hands, and feet.
1861.2.3 Produce renderings of various textiles, including folds and textures.

Standard 3: Develop reference materials. (1861.S.3)

Reference Materials Objectives
Students will:
1861.3.1 Begin to develop a portfolio of your best samples of graphic design and illustrative pieces.
1861.3.2 Correctly mount and mat pieces for display in a portfolio.
1861.3.3 Develop and maintain a picture morgue for illustrative reference.

Electrical Maintenance

This course will introduce students to the maintenance of electrical systems and motors in industrial maintenance occupations. Students will become familiar with tools and components of electrical motors and will perform a variety of operations using them.

Standard 1: Read and interpret electrical schematics and diagrams. (1871.S.1)

Electrical Schematics and Diagrams Objective
Students will:
1871.1.1 Explain the difference between power and control circuits.

Standard 2: Replace electric motors and protective devices. (1871.S.2)

Electric Motors and Protective Devices Objectives
Students will:
1871.2.1 Explain relevant sections of the National Electric Code.
1871.2.2 Calculate circuit amperage.
1871.2.3 Explain the difference between starting and running amperage.
1871.2.4 Explain and demonstrate how a magnetic contactor works.

Standard 3: Change rotation of electric motors. (1871.S.3)

Electric Motors Objectives
Students will:
1871.3.1 Identify parts of a three-phase motor.
1871.3.2 Describe current flow in a three-phase motor.
1871.3.3 Rewire a three-phase motor to change motor rotation.
1871.3.4 Describe current flow in a DC motor.
1871.3.5 Rewire a DC motor to change motor rotation.

Standard 4: Perform maintenance on electric motors. (1871.S.4)

Maintenance Objectives
Students will:
1871.4.1 Explain lock out tag out rules.
1871.4.2 Explain types of motor controllers.
1871.4.3 Explain how to clean and lubricate motors.

Standard 5: Use electrical test equipment to troubleshoot motor control circuits. (1871.S.5)

Electrical Test Equipment Objectives
Students will:
1871.5.1 Obtain various readings with a VOM.
1871.5.2 Test and replace semiconductors.
1871.5.3 Test DC power supplies.
1871.5.4 Use transistors, diodes, and resistors in electrical circuits.
1871.5.5 Install and test silicon controlled rectifiers.

Fundamentals of Industrial Equipment Maintenance

This course will introduce students to entry level skills in industrial maintenance occupations. Students will become familiar with hand tools and power machines used in industrial mechanics and will perform a variety of operations using them.

Standard 1: Identify, explore, and evaluate career opportunities related to industrial mechanics. (1873.S.1)

Career Opportunities Objectives
Students will:
1873.1.1 Describe a variety of careers related to industrial mechanics, and the training necessary to be successful in those careers.
1873.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of industrial mechanics.
1873.1.3 Identify sources of information about careers in industrial mechanics.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to industrial mechanics. (1873.S.2)

Safety Rules Objectives
Students will:
1873.2.1 Recognize and follow general shop safety guidelines.
1873.2.2 Identify, select and demonstrate proper use and care of all basic personal safety equipment.
1873.2.3 Demonstrate the proper selection and use of fire extinguishers.
1873.2.4 Describe OSHA regulations necessary when using hazardous materials.
1873.2.5 Describe proper waste disposal of industrial lubricants.

Standard 3: Select and apply industrial lubricants. (1873.S.3)

Industrial Lubricants Objectives
Students will:
1873.3.1 Differentiate between oil, grease, and synthetic lubricants and describe various applications for each type.
1873.3.2 Explain how lubricants get contaminated.
1873.3.3 List possible handling and storage problems of lubricants.

Standard 4: Straighten a shaft using a press. (1873.S.4)

Shaft Objectives
Students will:
1873.4.1 Demonstrate the setup of an arbor press, shaft and dial indicator, take readings (data), explain run out, spring back, high point and flat spotting.
1873.4.2 Explain the effects of using heat on a shaft if used for straightening purposes.
1873.4.3 Differentiate between a normal shaft and a hardened shaft.
1873.4.4 Explain the magna fluxing and sonar devices for testing and inspecting for hairline cracks in shafts.

Standard 5: Adjust gibs for full operation. (1873.S.5)

Gibs Objectives
Students will:
1873.5.1 Describe the function of a gib and give examples of its application.

1873.5.2 Describe "excessive wear" and "galled" in relationship to gibs.
1873.5.3 Explain the setup and reading of a dial indicator and micrometer for checking a gib.

Standard 6: Fabricate and install safety guards. (1873.S.6)

Safety Guards Objectives

Students will:

1873.6.1 Identify materials to be used, and illustrate safety guards to be fabricated and installed.
1873.6.2 Explain how a conveyor system functions and what guards are required.

Standard 7: Assemble and align a drive mechanism for a conveyor system. (1873.S.7)

Conveyor System Objectives

Students will:

1873.7.1 Identify different types of conveyor systems, where and why they are used.
1873.7.2 Explain alignment alternatives and various shimming techniques.
1873.7.3 Locate and explain manufacturer's specifications of alignment data, capacity limitations, and assembly procedures.

Standard 8: Identify basic tools used in industrial mechanics and perform various processes. (1873.S.8)

Basic Tools Objectives

Students will:

1873.8.1 Choose the proper tools for given applications, and describe the proper care and maintenance of each.
1873.8.2 Demonstrate adjustments necessary for each tool.
1873.8.3 Drill and tap internal threads and cut external threads of various size and pitch, using the proper thread cutting lubricants.
1873.8.4 Demonstrate the proper use of a band saw and power hack saw, and calculate the desired teeth per inch and cutting speed for various materials.
1873.8.5 Differentiate between tempering and annealing for ferrous and non-ferrous metals.
1873.8.6 Remove damaged screws or bolts, using various sizes and styles of screw extractors.
1873.8.7 Grind surfaces using portable electric grinder, using the proper abrasive.
1873.8.8 Demonstrate the use and maintenance of hand, pedestal and machine grinders by sharpening and deburring tools.
1873.8.9 Differentiate between drilling, boring, counter boring, spot facing, reaming and honing using a drill press, and demonstrate each procedure, using the proper lubricant.
1873.8.10 Mount work in universal lathe chuck, face work piece and center drill work piece.
1873.8.11 Bore and counter bore a hole and cut internal and external threads using lathe.
1873.8.12 Cut a horizontal surface and an external taper on lathe using compound rest.

Standard 9: Inspect and troubleshoot moving parts on machines. (1873.S.9)

Machines Objectives

Students will:

1873.9.1 Differentiate between damaged and normal set up using manufacturer's specifications.
1873.9.2 Identify parts of gear box, open gear drive and explain gear alignments and meshing requirements.

Hydraulics and Pneumatic Systems

This course will introduce students to the application of hydraulic and pneumatic systems used in industrial maintenance occupations. Students will become familiar with tools and components of hydraulics and pneumatics and will perform a variety of operations using them.

Standard 1: Read and interpret hydraulic and pneumatic diagrams. (1875.S.1)

Hydraulic and Pneumatic Diagrams Objectives
Students will:
1875.1.1 Identify and describe the function of component parts of hydraulic and pneumatic systems.
1875.1.2 Interpret symbols for hydraulics and pneumatics using CAD.
1875.1.3 Identify and describe mechanical servo valves and cartridge valves.

Standard 2: Refill or clean filters and refill system in hydraulic and pneumatic systems. (1875.S.2)

Clean Filters and Refill System Objectives
Students will:
1875.2.1 Describe techniques for draining systems.
1875.2.2 Identify various filters, screen, strainers, and types of hydraulic and compressor oils.

Standard 3: Replace and align hydraulic motors and pumps. (1875.S.3)

Hydraulic Motors and Pumps Objectives
Students will:
1875.3.1 Describe hydraulic pumps, the basic parts and the function of each part.
1875.3.2 Explain how a hydraulic unit functions.
1875.3.3 Identify alignment and couplings.
1875.3.4 Align piston rod of hydraulic pump and adjust pressure.

Standard 4: Install hydraulic and pneumatic lines and measure pressure. (1875.S.4)

Install Hydraulic and Pneumatic Lines Objectives
Students will:
1875.4.1 Identify piping, fittings, gaskets, and seals.
1875.4.2 Inspect and replace pressure relief valve.

Standard 5: Install guards and covers. (1875.S.5)

Guards and Covers Objective
Students will:
1875.5.1 Explain and use manufacturer's specifications for clearance and attachment techniques.

Engine Machining

This course will introduce students to the basic fundamentals related to high performance engine machining. Students will become familiar with the machining operations necessary to change a conventional stock engine into an oversized performance engine through technology.

Standard 1: Identify, explore, and evaluate different types of high performance engines. (1901.S.1)

High Performance Engines Objectives
Students will:

1901.1.1 Inspect complete engine components for wear – block, heads, connecting rods, crankshaft, camshaft, lifers, etc.
1901.1.2 Determine hardness of valve.
1901.1.3 Determine the new face angle that value should be machined to.
1901.1.4 Determine oversize that cylinder is to be machined to.
1901.1.5 Determine the finish to which cylinder should be honed.
1901.1.6 Recondition and resize rods.
1901.1.7 Bore out valve guides, install new guides, ream to appropriate size for valve
1901.1.8 Surface cylinder head to appropriate finish per application.
1901.1.9 Inspect crankshaft for cracks, pits, abrasions and then polish or grind depending on condition of crankshaft.
1901.1.10 Determine which camshaft is to be used per application: determine camshaft bearing size and appropriate method to install cam bearings into motor block.
1901.1.11 Check passages and restrictions in oiling systems of motor.

Fundamentals of Machine Tool Technology

This course will introduce students to the basic fundamentals related to machine tool technology. Students will become familiar with safety, blueprint reading, layout and measuring skills, and various hand and power tools used in the machine shop.

Standard 1: Identify, explore, and evaluate career opportunities related to metals technology. (1903.S.1)

Metals Technology Objectives
Students will:
1903.1.1 Describe a variety of careers related to metals technology, and the training necessary to be successful in those careers.
1903.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of metals technology.
1903.1.3 Identify sources of information about careers in metals technology.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to machine tool technology. (1903.S.2)

Safety Rules Objectives
Students will:
1903.2.1 Recognize and follow general shop safety guidelines.
1903.2.2 Explain and demonstrate the proper use and care of tools, machines, and equipment in the metals laboratory.
1903.2.3 Demonstrate the proper selection and use of fire extinguishers.
1903.2.4 Identify, demonstrate proper use and care of, and wear all basic personal safety equipment.
1903.2.5 Describe safety precautions necessary when using hazardous materials.

Standard 3: Demonstrate measuring skills and techniques used in machine tool technology. (1903.S.3)

Machine Tool Technology Objectives
Students will:
1903.3.1 Identify and properly use a variety of measuring equipment, including: a six inch rule, a 4R graduate rule, and a vernier caliper.
1903.3.2 Demonstrate use of inside and outside micrometer.

Standard 4: Interpret blueprints. (1903.S.4)

Blueprints Objectives
Students will:
1903.4.1 Draw sketches for jobs with notes and symbols.
1903.4.2 Interpret technical orders, standards and specifications for work applications.
1903.4.3 Form materials to blueprint specifications.

Standard 5: Identify basic hand tools used in machine tool technology and perform bench work processes. (1903.S.5)

Basic Hand Tools Objectives
Students will:
1903.5.1 Choose the proper hand tools for given applications, describe the proper care and maintenance of each, and demonstrate adjustments possible with each tool.

1903.5.2 Identify and maintain work holding devices, taps, dies and hand held tools.
1903.5.3 Cut internal and external threads using tap and die.
1903.5.4 Remove a broken bolt and tap.

Standard 6: Perform filing and grinding tasks. (1903.S.6)

Filing and Grinding Tasks Objectives
Students will:
1903.6.1 Demonstrate safe use of a pedestal grinder and use it to grind a center punch point, a chisel point edge, and a twist drill.
1903.6.2 Inspect, dress and true a grinding wheel, and adjust wheel guard and tool rest on grinder.
1903.6.3 Using hand tools, cut and file a square workpiece to precision specifications.

Standard 7: Demonstrate basic band saw operations and use. (1903.S.7)

Basic Band Saw Operations Objectives
Students will:
1903.7.1 Clean, lubricate, and inspect a bandsaw for safe operation.
1903.7.2 Layout and cut off material using both a vertical and horizontal bandsaw.
1903.7.3 Select, install, cut and weld bandsaw blades.

Standard 8: Demonstrate basic drill press operations and use. (1903.S.8)

Basic Drill Press Operations Objectives
Students will:
1903.8.1 Clean, lubricate, and inspect a drill press for safe operation.
1903.8.2 Select, mount, and secure holding device for drill press.
1903.8.3 Perform tapping, countersinking, counter boring, and spot facing operations on drill press.

Standard 9: Demonstrate basic metal lathe operations and use. (1903.S.9)

Basic Metal Lathe Operations Objectives
Students will:
1903.9.1 Clean, lubricate, and inspect a metal lathe for safe operation.
1903.9.2 Mount work in universal lathe chuck, face workpiece, center drill workpiece.
1903.9.3 Center tool bit in lathe using tail stock.
1903.9.4 Perform setup using dial indicator.
1903.9.5 Use a pedestal grinder to shape and sharpen left and right hand cutting tools, grind a radius and cutting edge on a lathe tool kit.
1903.9.6 Perform a variety of lathe operations, including turn round stock to specific size, knurl a workpiece, and freehand form a workpiece.

Standard 10: Demonstrate basic milling machine operations and use. (1903.S.10)

Basic Milling Machine Operations Objectives
Students will:
1903.10.1 Clean, lubricate and inspect a milling machine for safe operation.
1903.10.2 Align vice, locate center of workpiece, and seat workpiece in vice on mill.
1903.10.3 Square stock to size, using a milling machine.

Machine Processes

This course will provide students with an introduction to metallurgy and advanced power tool skills related to machine tool technology.

Standard 1: Describe the structure and classifications of machining metals. (1905.S.1)

Machining Metals Objectives
Students will:
1905.1.1 Describe the open hearth, Bessemer converter, electric furnace, and basic oxygen process of making steel.
1905.1.2 Classify low, medium, and high carbon steel, and tool and die steels according to the SAE and AISI systems.
1905.1.3 Identify the carbon content of alloy metals using the spark test method.
1905.1.4 Classify aluminum according to the Aluminum Association four digit numbering code.

Standard 2: Perform advanced grinding techniques. (1905.S.2)

Grinding Techniques Objectives
Students will:
1905.2.1 Grind a slot in workpiece.
1905.2.2 Dress angle on grinding wheel.

Standard 3: Demonstrate advanced lathe operations. (1905.S.3)

Lathe Operations Objectives
Students will:
1905.3.1 Cut internal taper surface using taper attachment.
1905.3.2 Cut taper using tailstock off set.
1905.3.3 Chase internal right hand and left hand threads.
1905.3.4 Chase external and internal acme threads.
1905.3.5 Chase external pipe threads.
1905.3.6 Turn an eccentric on lathe.
1905.3.7 Machine a workpiece using face plate.

Standard 4: Demonstrate advanced milling operations. (1905.S.4)

Milling Operations Objectives
Students will:
1905.4.1 Machine woodruff keyway in workpiece.
1905.4.2 Bore and counterbore hole in workpiece.
1905.4.3 Drill holes to specified angles using angular indexing.
1905.4.4 Cut a sprocket using simple indexing.
1905.4.5 Machine a spline using index head.
1905.4.6 Machine a spur gear.

Standard 5: Demonstrate CNC machining operations. (1905.S.5)

CNC Matching Operations Objectives
Students will:
1905.5.1 Identify the various parts of CNC equipment and describe how it operates.
1905.5.2 Demonstrate setup procedure for and properly operate CNC equipment.
1905.5.3 Calculate CNC programming geometry problems.

1905.5.4 Analyze part symmetry for CNC machining.
1905.5.5 Write CNC programs using G and M codes.
1905.5.6 Write incremental and absolute CNC programs.
1905.5.7 Solve angles for CNC program.

Machining Processes and Applications

This course will provide students with intermediate hand and power tool skills related to machine tool technology.

Standard 1: Demonstrate intermediate measuring skills. (1907.S.1)

Measuring Skills Objectives
Students will:
1907.1.1 Perform measuring skills using vernier calipers.
1907.1.2 Scribe circles, radian, and parallel lines on a workpiece.

Standard 2: Demonstrate intermediate vertical band saw operations. (1907.S.2)

Vertical Band Saw Objectives
Students will:
1907.2.1 Layout and saw an angle using vertical bandsaw.
1907.2.2 Perform contour cutting on vertical bandsaw.

Standard 3: Demonstrate intermediate grinding operations. (1907.S.3)

Grinding Operations Objectives
Students will:
1907.3.1 Mount and balance a grinding wheel on pedestal grinder.
1907.3.2 Grind flat, vertical, and angular surfaces.
1907.3.3 Grind a workpiece square and parallel to precision specifications.

Standard 4: Demonstrate intermediate metal lathe operations. (1907.S.4)

Metal Lathe Objectives
Students will:
1907.4.1 Counterbore hole in a workpiece.
1907.4.2 Part off workpiece.
1907.4.3 Machine an external taper using a taper attachment.
1907.4.4 Turn a long shaft between centers.
1907.4.5 Indicate shaft in lathe using a steady rest.
1907.4.6 Align tailstock using a dial indicator.
1907.4.7 Machine internal and external o-ring grooves.

Standard 5: Demonstrate intermediate milling operations. (1907.S.5)

Milling Operations Objectives
Students will:
1907.5.1 End mill key seats in workplace.
1907.5.2 Drill equally spaced holes on a bolt circle.
1907.5.3 Machine slots in workpiece.
1907.5.4 Machine equally spaced slots using direct indexing.
1907.5.5 Machine a hexagon workpiece using simple indexing.
1907.5.6 Align milling machine head, center drill workpiece, drill hole, and ream hole in workpiece on mill.
1907.5.7 Set-up workpiece using clamps.
1907.5.8 Flycut workpiece on vertical mill.

Metal Trades Processes and Application

This course will introduce students to the basic fundamentals related to machine tool and welding technology. Students will develop advanced skills using various hand and power tools.

Standard 1: Demonstrate measuring skills and techniques. (1909.S.1)

Measuring Skills and Techniques Objective
Students will:
1909.1.1 Use a dial indicator properly.

Standard 2: Perform metal pressing operations. (1909.S.2)

Metal Pressing Operations Objectives
Students will:
1909.2.1 Bend and straighten parts using hydraulic iron worker.
1909.2.2 Set-up and brake workpiece using hydraulic press.
1909.2.3 Perform metal shear operations.

Standard 3: Perform power saw operations. (1909.S.3)

Power Saw Operations Objectives
Students will:
1909.3.1 Select speeds, feeds, and adjust power saw.
1909.3.2 Perform contour cuts using vertical band saw.

Standard 4: Perform metal lathe operations and procedures. (1909.S.4)

Metal Lathe Operations and Procedures Objectives
Students will:
1909.4.1 Perform drilling, tapping, reaming, counterboring and countersinking operations on a lathe.
1909.4.2 File and polish using lathe.
1909.4.3 Cut internal and external V threads.
1909.4.4 Cut internal and external tapers.

Standard 5: Perform milling machine operations and procedures. (1909.S.5)

Milling Machine Operations and Procedures Objectives
Students will:
1909.5.1 Perform side cutter operations.
1909.5.2 Demonstrate simplified indexing operation on milling machine.
1909.5.3 Cut key slots using milling machine.
1909.5.4 Perform slitting saw operation on milling machine.
1909.5.5 Perform slot milling operation.
1909.5.6 Set-up and align milling machine and holding devices.

Standard 6: Demonstrate CNC machining operations. (1909.S.6)

CNC Machining Operations Objectives
Students will:
1909.6.1 Identify the various parts of CNC equipment and describe how it operates.
1909.6.2 Demonstrate setup procedure for and properly operate CNC equipment.
1909.6.3 Calculate CNC programming geometry problems.

1909.6.4 Analyze part symmetry for CNC machining.
1909.6.5 Write CNC programs using G and M codes.
1909.6.6 Write incremental and absolute CNC programs.
1909.6.7 Solve angles for CNC program.

Standard 7: Demonstrate advanced Gas Metal Arc welding techniques. (1909.S.7)

Gas Metal Arc Objectives
Students will:
1909.7.1 Select, prepare, adjust, and operate Gas Metal Arc welding equipment.
1909.7.2 Prepare, position, and tack weld parts for Gas Metal Arc welding.
1909.7.3 Perform flat and vertical Gas Metal Arc welding positions.

Standard 8: Demonstrate advanced Gas Tungsten Arc welding techniques. (1909.S.8)

Gas Tungsten Arc Objectives
Students will:
1909.8.1 Operate Gas Tungsten Arc welding equipment to weld aluminum in flat position.
1909.8.2 Operate Gas Tungsten Arc welding equipment to weld steel in flat position.

Standard 9: Demonstrate basic Shielded Metal Arc welding. (1909.S.9)

Shielded Metal Arc Objectives
Students will:
1909.9.1 Set up and adjust Shielded Metal Arc welding equipment.
1909.9.2 Arc weld carbon steel in flat position.
1909.9.3 Perform Shielded Metal Arc weld of carbon steel in vertical and overhead position.

Block and Rock Laying

This course will introduce students to the basic fundamentals of block and rock laying. Students will become familiar with basic tools, equipment and techniques used in block and rock laying.

Standard 1: Install a block foundation. (1911.S.1)

Block Foundation Objectives
Students will:
1911.1.1 Describe how to locate the corners of a foundation wall on the footing from batter boards.
1911.1.2 Estimate materials needed for a foundation project.
1911.1.3 Lay out, bond, build and waterproof a foundation project.
1911.1.4 Describe and install wire reinforcement and lintels in a block wall.

Standard 2: Lay concrete block to the line. (1911.S.2)

Concrete Block Objectives
Students will:
1911.2.1 Define terms associated with laying block.
1911.2.2 Identify methods of putting up a line.
1911.2.3 Lay out a block wall, and lay block to the line using an established level.
1911.2.4 Discuss the importance of having uniform bed joints and head joints.

Standard 3: Lay block leads. (1911.S.3)

Block Leads Objectives
Students will:
1911.3.1 Write a paragraph describing the importance and purpose of laying block leads to the correct height, level and plumb.
1911.3.2 Estimate materials and build an outside and inside corner lead seven courses high.
1911.3.3 Build a block partition wall with control joints.

Standard 4: Lay stone. (1911.S.4)

Stone Objectives
Students will:
1911.4.1 Define terms associated with cut stone.
1911.4.2 Describe various types of stone, and the procedure for laying out stone.
1911.4.3 Select types of anchors used in setting stone.
1911.4.4 Identify methods of handling stone.
1911.4.5 List factors to consider when setting stone.
1911.4.6 Lay a stone wall.

Bricklaying

This course will introduce students to the basic fundamentals of bricklaying. Students will become familiar with basic tools, equipment and techniques used in bricklaying.

Standard 1: Tool brick and mortar joints. (1913.S.1)

Tool Brick and Mortar Joints Objectives
Students will:
1913.1.1 Identify the different types of jointers and their specific uses.
1913.1.2 Strike, brush, and polish the following joints: rake joints, squeeze joints, trowel struck joints and V-joints.
1913.1.3 Grind and repair a brick wall.

Standard 2: Lay brick to the line. (1913.S.2)

Brick Objectives
Students will:
1913.2.1 Define terms associated with laying brick to the line.
1913.2.2 Identify and demonstrate methods of putting up a line and setting a trig brick.
1913.2.3 Dry bond a wall.
1913.2.4 Lay brick to the line using established leads and corner poles, and discuss the importance of each.
1913.2.5 Discuss the importance of having a plumb bond.
1913.2.6 Discuss the purpose of wall ties and describe how to install them.

Standard 3: Construct brick corners. (1913.S.3)

Brick Corners Objectives
Students will:
1913.3.1 Define terms associated with laying racked-back leads, inside corners, outside return corners and toothed-out leads.
1913.3.2 Write a short paragraph describing the purposes of leads.
1913.3.3 Lay a racked back, pyramid, inside and outside return corner, toothed lead.

Standard 4: Lay different brick positions. (1913.S.4)

Brick Positions Objectives
Students will:
1913.4.1 Discuss the different meanings of bonding, and identify various types of bonds.
1913.4.2 Define terms associated with wall layout.
1913.4.3 Correctly identify and describe the six different brick positions.
1913.4.4 Lay a double wall that contains stretches, headers, soldiers, shiners, row locks and sailors.

Standard 5: Install brick paving. (1913.S.5)

Brick Paving Objectives
Students will:
1913.5.1 List the various types of bricks and pattern bonds in paving and flooring.
1913.5.2 Describe how brick paving and floors are laid with and without mortar.
1913.5.3 Lay various brick patterns within a 2' x 4' frame.

Standard 6: Build chimneys and fireplaces. (1913.S.6)

Chimneys and Fireplaces Objectives
Students will:
1913.6.1 Define terms associated with chimneys and fireplaces.
1913.6.2 Identify various types of fireplaces, and identify the basic parts of a fireplace.
1913.6.3 Discuss the factors to consider in constructing fireplaces and chimneys.
1913.6.4 Write a paragraph describing the procedure for buttering a firebrick.
1913.6.5 Describe the characteristics of a firebox, and properly construct one.
1913.6.6 Construct a fireplace.
1913.6.7 Form a corbel.

Standard 7: Construct a flight of steps. (1913.S.7)

Steps Objectives
Students will:
1913.7.1 Define terms related to the parts of a porch and steps.
1913.7.2 Describe the relationship between riser and tread and why it is important in building steps.
1913.7.3 Describe how brick steps are laid out and constructed, and lay out and build a set of brick steps.

Standard 8: Lay out and construct an arch. (1913.S.8)

Arch Objectives
Students will:
1913.8.1 Define terms associated with arch construction, and describe the major types of arches used today.
1913.8.2 Describe the theory and function of an arch.
1913.8.3 Describe how wood arch forms are constructed in arches.
1913.8.4 Lay out and construct a semi-circular arch.

Concrete Finishing

This course will apply the concepts, applications, and techniques necessary for various phases of concrete construction.

Standard 1: Understand concrete construction and finishing concepts. (1915.S.1)

Concrete Construction Objectives
Students will:
1915.1.1 Define terms associated with concrete construction.
1915.1.2 Identify the composition and characteristics of concrete.
1915.1.3 Identify the uses of concrete as a building material.
1915.1.4 Identify the effect of craftsmanship on finished concrete.
1915.1.5 Explain the concrete construction process.
1915.1.6 Identify site operation work requirements.
1915.1.7 Explain the career potentials in concrete construction and finishing.

Standard 2: Understand and apply safety used in concrete construction. (1915.S.2)

Safety Objectives
Students will:
1915.2.1 Describe and wear different types of safety gear for the work site.
1915.2.2 State the guidelines for dressing appropriately for concrete work.
1915.2.3 Describe how to safely handle concrete when forming, placing, curing, and finishing.
1915.2.4 Describe safety precautions to follow when working in extreme heat and cold.
1915.2.5 Describe safety precautions to follow when working with hazardous materials.
1915.2.6 Describe proper procedures for handling and maintaining concrete construction tools safely.

Standard 3: Analyze the properties of concrete. (1915.S.3)

Properties of Concrete Objectives
Students will:
1915.3.1 Describe the properties of concrete.
1915.3.2 Explain how the properties of concrete are used in construction.
1915.3.3 Determine how the ingredients of concrete influence mix, placement, finishing, durability, and performance.
1915.3.4 Describe quality-control tests on concrete ingredients, fresh concrete, and hardened concrete.
1915.3.5 Mix a test batch of concrete.
1915.3.6 Perform a slump test.

Standard 4: Identify tools and equipment used in concrete construction. (1915.S.4)

Tools and Equipment Objectives
Students will:
1915.4.1 Name the tools used in placing and finishing concrete.
1915.4.2 Name the power equipment used in placing and finishing concrete.
1915.4.3 Describe how each tool is use.
1915.4.4 Describe how the power equipment is used.
1915.4.5 Associate trade terms with the appropriate tools and equipment.

Standard 5: Prepare worksite for concrete placement. (1915.S.5)

Concrete Placement Objectives
Students will:
1915.5.1 Describe basic site layout using levels and measuring tools.
1915.5.2 Properly locate, grade, and build forms for horizontal placement.
1915.5.3 Perform compaction activities on subgrades.
1915.5.4 Describe various joints and where to locate them.
1915.5.5 Describe various reinforcements and how to place them.
1915.5.6 Describe information needed when ordering concrete.

Standard 6: Place concrete. (1915.S.6)

Place Concrete Objectives
Students will:
1915.6.1 Describe how concrete is conveyed and placed.
1915.6.2 Draw up a pre-placement checklist.
1915.6.3 Demonstrate the use of equipment and tools for placing concrete.
1915.6.4 Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form.
1915.6.5 Associate trade names with the appropriate processes and equipment.

Standard 7: Apply basic concrete finishing techniques. (1915.S.7)

Finishing Techniques Objectives
Students will:
1915.7.1 Describe the basic finishing process.
1915.7.2 Use the following finishing hand tools: float, edger, groover, and trowel.
1915.7.3 Mark and cut joints with a saw.
1915.7.4 Apply a broom finish.
1915.7.5 Apply a rubbing finish.
1915.7.6 Associate trade terms with the appropriate processes and equipment.

Standard 8: Curing and protecting concrete. (1915.S.8)

Curing and Protecting Concrete Objectives
Students will:
1915.8.1 Describe the process of curing concrete.
1915.8.2 Identify methods of curing concrete.
1915.8.3 Describe how each method is applied.
1915.8.4 Identify when each method is used.
1915.8.5 Associate trade terms with the appropriate processes and equipment.

Standard 9: Troubleshooting basic concrete construction problems. (1915.S.9)

Construction Problems Objectives
Students will:
1915. 9.1 Describe a basic troubleshooting methodology that can be used to identify a variety of concrete construction problems and their causes.
1915. 9.2 Identify problems with fresh concrete and describe ways to prevent them.
1915. 9.3 Identify different concrete defects such as crazing, cracking, dusting, scaling, popouts, and efflorescence, and describe ways to prevent them.

Foundations And Footings

This course will introduce students to the basic fundamentals of laying foundations and footings. Students will become familiar with basic tools, equipment and techniques used to lay foundations and footings.

Standard 1: Layout a foundation. (1917.S.1)

Foundation Objectives
Students will:
1917.1.1 Discuss the importance of accuracy in foundation layout.
1917.1.2 Describe how to square a foundation by finding the diagonal.
1917.1.3 Describe the important features of a foundation.
1917.1.4 Name the parts of a builders level and transit, and set up and adjust both properly.
1917.1.5 Lay out and square a foundation using a transit and the 6-8-10 method.
1917.1.6 Discuss the importance of the location, installation and use of batter boards.

Standard 2: Layout a footer. (1917.S.2)

Footer Objectives
Students will:
1917.2.1 Discuss the size of footings for various widths of block.
1917.2.2 Describe the two types of footings used for a foundation.
1917.2.3 Describe the use of steel reinforcement in concrete, and how a footing is placed and cured.
1917.2.4 Describe how to estimate materials for a footing.
1917.2.5 Estimate and prepare a material list for a footer.

Standard 3: Demonstrate knowledge of blueprint reading. (1917.S.3)

Blueprint Reading Objectives
Students will:
1917.3.1 Identify various types of working drawings, and describe the divisions found in a set of building plans.
1917.3.2 Measure accurately using an architects scale.
1917.3.3 Interpret a set of brick masonry specifications, listing major items found on the specifications and the items that may be shown in detail.
1917.3.4 Properly read a structural plan, a plan view, and a finish schedule.

Fundamentals of Masonry

This course will introduce students to the basic fundamentals in the masonry industry. Students will become familiar with basic tools, equipment and techniques used in masonry.

Standard 1: Identify, explore, and evaluate career opportunities related to masonry. (1919.S.1)

Career Opportunities Objectives
Students will:
1919.1.1 Describe a variety of careers related to masonry, and the training necessary to be successful in those careers.
1919.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of masonry.
1919.1.3 Identify sources of information about careers in masonry.

Standard 2: Demonstrate knowledge of basic blueprint reading. (1919.S.2)

Blueprint Reading Objectives
Students will:
1919.2.1 Interpret scale drawings.
1919.2.2 Define terms, abbreviations and symbols associated with basic blueprint reading.
1919.2.3 Demonstrate knowledge of specifications and codes.

Standard 3: Demonstrate safe work habits while working with masonry materials and equipment. (1919.S.3)

Safe Work Habits Objectives
Students will:
1919.3.1 Identify and practice safety rules used in the masonry lab.
1919.3.2 Complete a safety checklist.
1919.3.3 Identify safety practices related to the use of various hand and power masonry tools.

Standard 4: Identify and properly use various hand tools related to the masonry field. (1919.S.4)

Hand Tools Objectives
Students will:
1919.4.1 Identify and describe various masonry tools, and demonstrate how to use them properly.
1919.4.2 Explain the basic rules concerning the care of masonry hand tools.

Standard 5: Demonstrate proper and safe use of ladders and scaffolds. (1919.S.5)

Ladders and Scaffolds Objective
Students will:
1919.5.1 Identify basic types of ladders and scaffolds and safely erect both using proper placement and angle.

Standard 6: Describe various masonry units and the manufacturing processes used to produce them. (1919.S.6)

Masonry Units Objectives
Students will:
1919.6.1 Describe the development of brick and how they are used today.
1919.6.2 Describe the methods of block manufacturing from early times to present.

1919.6.3 Match the description of various brick and block units to correct size of the units.
1919.6.4 List the different proportions and characteristics of brick.

Standard 7: Identify the different mortar types and their characteristics. (1919.S.7)

Mortar Objectives
Students will:
1919.7.1 Identify the various types of mortar used in masonry work.
1919.7.2 Describe admixtures and their purpose in masonry work.
1919.7.3 Describe the causes and prevention of efflorescence.

Standard 8: Interpret and read the various rules in masonry work. (1919.S.8)

Masonry Objectives
Students will:
1919.8.1 Describe the purpose of brick spacing and its purpose in spacing mortar joints.
1919.8.2 Describe the purpose of a modular rule and how it is used in relation to modular construction.

Standard 9: Properly mix and spread mortar. (1919.S.9)

Mortar Objectives
Students will:
1919.9.1 Define terms associated with spreading mortar.
1919.9.2 Proportion mortar ingredients for specific mixes, and mix to the proper consistency using a mortar hoe and a power mortar mixer.
1919.9.3 Identify different methods of picking up mortar from a board and pan.
1919.9.4 Distinguish between the correct and incorrect ways of holding a trowel and properly spread mortar.
1919.9.5 Label head and bed joints when given an illustration.
1919.9.6 Demonstrate the ability to spread mortar on a 2x4.

Fundamentals of Materials Distribution

This course will introduce students to the careers, skills and knowledge necessary to obtain employment in occupations related to preparing, accepting, checking and storing goods received for business and industry.

Standard 1: Identify, explore, and evaluate career opportunities related to materials handling and inventory control. (1921.S.1)

Career Opportunities Objectives
Students will:
1921.1.1 Describe a variety of careers related to materials handling and inventory control, and the training necessary to be successful in those careers.
1921.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of materials handling and inventory control.
1921.1.3 Identify sources of information about careers in materials handling and inventory control.

Standard 2: Demonstrate knowledge of basic safety rules and equipment as it relates to materials handling and inventory control. (1921.S.2)

Safety Rules Objectives
Students will:
1921.2.1 Recognize and follow general shop safety guidelines.
1921.2.2 Identify, select and demonstrate proper use and care of all basic personal safety equipment.
1921.2.3 Demonstrate proper lifting techniques and describe injuries that may occur if these procedures are not followed.
1921.2.4 Demonstrate the proper selection and use of fire extinguishers.
1921.2.5 Describe safety precautions used when handling hazardous materials.
1921.2.6 Demonstrate first aid procedures for immediate care in a variety of injuries.

Standard 3: Prepare merchandise for shipment. (1921.S.3)

Shipment Objectives
Students will:
1921.3.1 Address packages, cartons, and containers, and deliver merchandise to proper station for shipment.
1921.3.2 Determine method of shipment, UPS charges, and truck charges.
1921.3.3 Build skids, pallets, and boxes.
1921.3.4 Obtain goods from stockroom or warehouse; inspect merchandise to ensure entire order can be accounted for.
1921.3.5 Prepare invoices and appropriate shipping forms.
1921.3.6 Prepare damaged goods claims and package damaged goods for reshipment.

Standard 4: Accept and check materials received. (1921.S.4)

Accept and Check Materials Objectives
Students will:
1921.4.1 Describe the procedure for assisting carrier in off-loading supplies.
1921.4.2 Check invoice against purchase order and number of cartons against bill of lading.
1921.4.3 Prepare overage, shortage and discrepancy (OS&D) report and record carrier name and carrier number on receiving report.
1921.4.4 Spot check cartons for damage.

Standard 5: Properly store goods received. (1921.S.5)

Store Goods Received Objectives

Students will:

1921.5.1 Arrange goods according to identification codes.
1921.5.2 Check descriptions of goods against invoices.
1921.5.3 Maintain and update master warehouse location plans.
1921.5.4 Move goods to proper stocking area (normal control, first-in/first-out).
1921.5.5 Open containers with proper tools.
1921.5.6 Provide secure storage for property that is classified, sensitive, radioactive, hazardous or flammable.
1921.5.7 Store goods in proper location (bins, racks, etc.).

Materials Distribution Equipment

This course will introduce students to various skills and knowledge necessary in moving goods for business and industry with manual and power equipment.

Standard 1: Demonstrate safe and efficient use of manual materials handling equipment. (1923.S.1)

Equipment Objectives
Students will:

1923.1.1 List and explain the uses of various kinds of material handling equipment.
1923.1.2 Properly operate a dolly, desk mover, file cabinet mover, and a barrel truck.
1923.1.3 Properly operate a four-wheeled platform truck.
1923.1.4 Properly operate a 5000 lb. manual pallet jack.
1923.1.5 Properly operate a manually operated banding machine and demonstrate the use of plastic wrap.

Standard 2: Demonstrate safe and efficient use of powered materials handling equipment. (1923.S.2)

Handling Equipment Objectives
Students will:

1923.2.1 Identify and explain the parts and controls of powered industrial trucks and manlift cages.
1923.2.2 Define and properly use forklift terms.
1923.2.3 Properly operate a stand up & reach fork truck (electric).
1923.2.4 Properly operate both an LPG/gas and an electric a sit down fork truck.
1923.2.5 Properly operate an electric order selector fork truck.
1923.2.6 Properly operate an electric pallet jack.
1923.2.7 List proper battery charging procedures and storage.
1923.2.8 List proper refueling procedures for LPG/gas powered fork trucks.
1923.2.9 Identify and describe the parts and controls of materials handling robots.
1923.2.10 Demonstrate basic robotic programming.

Materials Management

This course will introduce students to the preparation of printed data for materials handling, using a variety of inventorying equipment.

Standard 1: Perform computer operations related to maintaining an inventory. (1925.S.1)

Computer Operations Objectives
Students will:
1925.1.1 Demonstrate computer functions and start up procedures.
1925.1.2 Prepare receiving reports and purchase requisitions.
1925.1.3 Demonstrate data entry.
1925.1.4 Prepare printouts on inventory by number or descriptions and packing lists.
1925.1.5 Prepare printed packing lists, purchase orders, and invoices.
1925.1.6 Demonstrate inventory adjustments.
1925.1.7 Prepare vendor list, sales register, and customer lists.
1925.1.8 Edit accounts.
1925.1.9 Print price lists.
1925.1.10 Define computerized inventory terms.

Standard 2: Perform bar code inventory operations related to performance inventory procedures. (1925.S.2)

Bar Code Objectives
Students will:
1925.2.1 Demonstrate UPC bar code reader operations.
1925.2.2 List operational procedures to upload and download inventory.
1925.2.3 Demonstrate proper care and storage of bar code equipment.
1925.2.4 List proper procedures to print bar code labels.

Supervisory Skills In Warehousing

This course will instruct students in proper performance and execution of managerial duties in a warehouse.

Standard 1: Perform managerial duties within the warehouse. (1927.S.1)

Managerial Duties Objectives
Students will:
1927.1.1 Interpret policies, directives, or procedures for personnel.
1927.1.2 Plan layout of facilities and storage of goods.
1927.1.3 Prepare requisitions for in-house supplies or equipment.
1927.1.4 Supervise the accomplishment of work priorities.
1927.1.5 Supervise inventory of goods in the facility.
1927.1.6 Supervise receiving operations.
1927.1.7 Supervise shipping operations.
1927.1.8 Supervise storage of goods in the facility.

Standard 2: Perform personnel training duties within the warehouse. (1927.S.2)

Personnel Training Objectives
Students will:
1927.2.1 Prepare training and evaluation procedures for personnel.
1927.2.2 Role play an interview with a potential employee.
1927.2.3 Prepare employee selection criteria.
1927.2.4 Prepare and update employee portfolio.

Standard 3: Perform the administrative functions required in warehousing. (1927.S.3)

Administrative Functions Objectives
Students will:
1927.3.1 Adjust inventory records and complete inventory reports.
1927.3.2 Audit stock balance and consumption reports.
1927.3.3 Conduct on-going and periodic physical inventory.
1927.3.4 Make entries on the stock locator system cards to show changes in location of goods, and properly file cards.
1927.3.5 Prepare requisition and shipment documents.
1927.3.6 Post transaction data to stock control record cards.

Introduction to SQL and PL/SQL

This course offers students an extensive introduction to data-server technology. Students are taught to create and maintain database objects and to store, retrieve and manipulate data using the powerful SQL and PL/SQL programming languages. Students will create blocks of application code that can be shared by multiple forms, reports and data management applications. They will demonstrate this learning by revisiting their WebDB database project and use SQL in place of the GUI interface. Through the use of SQL and PL/SQL, students will gain fast, efficient and secure access to the database.

Standard 1: Demonstrate knowledge of SQL. (1931.S.1)

SQL Objectives
Students will:
1931.1.1 Identify the structural elements of a relational database table.
1931.1.2 List and describe the System Development Life Cycle.
1931.1.3 Describe the Oracle implementation of the Relational Database Management System RDBMS) and Object Relational Database Management System (ORDBMS).
1931.1.4 Explain how SQL and PL/SQL are used in the Oracle Product Set. Identify the advantages of PL/SQL.

Standard 2: Write basic SQL statements. (1931.S.2)

Write SQL Statements Objectives
Students will:
1931.2.1 List the capabilities of SQL SELECT statements.
1931.2.2 Execute a basic SELECT statement.
1931.2.3 Differentiate between SQL statements and SQL*Plus commands.

Standard 3: Restrict and sort data. (1931.S.3)

Restrict and Sort Data Objectives
Students will:
1931.3.1 Identify and model various types of entities.
1931.3.2 Identify naming and drawing conventions for entities.
1931.3.3 Sequence the steps that are necessary for creation of an entity.
1931.3.4 Analyze and model the relationships between entities.

Standard 4: Perform single row functions. (1931.S.4)

Row Functions Objectives
Students will:
1931.4.1 Perform calculations on data.
1931.4.2 Modify individual data items.
1931.4.3 Use character, number and date functions in SELECT statements.
1931.4.4 Format data and numbers for display purposes.
1931.4.5 Convert column data types.

Standard 5: Display data from multiple tables. (1931.S.5)

Multiple Tables Objectives
Students will:
1931.5.1 Construct SELECT statements to access data from more than one table using equality and

nonequality joins.

1931.5.2 Use outer joins through viewing data that generally does not meet a join condition.

1931.5.3 Join a table to itself.

Standard 6: Aggregate data using group functions. (1931.S.6)

Group Functions Objectives

Students will:

1931.6.1 Identify the available group functions and describe their use.

1931.6.2 Demonstrate the ability to group data through the use of the GROUP BY clause.

1931.6.3 Demonstrate the ability to include or exclude grouped rows by using the HAVING clause.

Standard 7: Demonstrate knowledge of subqueries. (1931.S.7)

Subqueries Objectives

Students will:

1931.7.1 Write a query with an embedded subquery.

1931.7.2 Evaluate and perform a multiple-column subquery.

1931.7.3 Describe and explain the behavior of subqueries when null values are retrieved.

1931.7.4 Create a subquery in a FROM clause.

Standard 8: Produce readable output with SQL* Plus and manipulate data. (1931.S.8)

Readable Output Objectives

Students will:

1931.8.1 Produce queries that require an input variable.

1931.8.2 Customize the SQL*Plus environment using SET commands for control.

1931.8.3 Produce more readable output through the use of the COLUMN and BREAK commands.

1931.8.4 Identify Data Manipulation Language (DML) and describe various DML statements.

1931.8.5 Utilize Data Manipulation Language (DML) through inserting, updating and deleting rows from a table.

1931.8.6 Control transactions using COMMIT and ROLLBACK statements.

Standard 9: Create and manage database objects. (1931.S.9)

Database Objects Objectives

Students will:

1931.9.1 Describe the main database objects.

1931.9.2 Create tables and alter their definitions.

1931.9.3 Describe the data types that can be used when specifying column definition.

Standard 10: Alter tables and constraints implementing views. (1931.S.10)

Alter Tables Objectives

Students will:

1931.10.1 Create, drop, rename and truncate tables using SQL*Plus.

1931.10.2 Identify and describe various constraints including NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY and CHECK.

1931.10.3 Create and maintain constraints including Adding, Dropping, Enabling, Disabling and Cascading.

1931.10.4 Recognize views and explain how they are created, how they retrieve data and how they perform DML operations.

Standard 11: Create and implement views, synonyms, indexes and other database objects. (1931.S.11)

Database Objects Objectives
Students will:
1931.11.1 Create views, retrieve data through a view, alter the definition of a view and drop a view.
1931.11.2 Categorize information by using Top-N queries to retrieve specified data.
1931.11.3 Identify the features of a sequence and display sequence values using a data dictionary view.
1931.11.4 Identify the characteristics of a cached sequence.
1931.11.5 Modify and remove a sequence using a SQL statement.
1931.11.6 Identify the features of private and public synonyms.
1931.11.7 Identify characteristics of an index and describe different types.
1931.11.8 Create and remove an index using a SQL statement.

Standard 12: Control user access and SQL workshop. (1931.S.12)

Control User Access Objectives
Students will:
1931.12.1 Identify the features of database security.
1931.12.2 Create users using SQL*Plus statements.
1931.12.3 Grant and Revoke object privileges using SQL*Plus.

Standard 13: Demonstrate knowledge of PL/SQL. (1931.S.13)

PL/SQL Objectives
Students will:
1931.13.1 List and describe the benefits of PL/SQL.
1931.13.2 Recognize the basic PL/SQL block and its sections.
1931.13.3 Declare PL/SQL variables and describe their significance.
1931.13.4 Execute a PL/SQL block.

Standard 14: Write executable statements working with composite datatype. (1931.S.14)

Executable Statements Objectives
Students will:
1931.14.1 Recognize the significance of the executable section and decide when to use it.
1931.14.2 Write PL/SQL statements in the executable section.
1931.14.3 Describe the rules of nested blocks.
1931.14.4 Identify and utilize appropriate coding conventions.
1931.14.5 Create a PL/SQL block that selects, inserts and updates data in a table.

Standard 15: Write control structures interacting with the Oracle server. (1931.S.15)

Control Structures Objectives
Students will:
1931.15.1 Identify the uses and types of control structures.
1931.15.2 Construct and execute an IF statement.
1931.15.3 Evaluate differences between loop statements.
1931.15.4 Control block flow through the use of nested loops and labels.

Standard 16: Write explicit cursors. (1931.S.16)

Cursors Objectives
Students will:
1931.16.1 Distinguish between an implicit and explicit cursor.
1931.16.2 Use a PL/SQL record variable.
1931.16.3 Write a cursor FOR loop.
1931.16.4 Determine when a FOR UPDATE clause in a cursor is required.
1931.16.5 Write a cursor that uses a subquery.

Standard 17: Demonstrate knowledge of handling exceptions review for the certification exam. (1931.S.17)

Handling Exceptions Objectives
Students will:
1931.17.1 Define PL/SQL exceptions.
1931.17.2 Recognize unhandled exceptions.
1931.17.3 List and use different types of PL/SQL exception handlers.
1931.17.4 Trap unanticipated errors.
1931.17.5 Describe the effect of exception propagation in nested blocks.
1931.17.6 Customize PL/SQL exception messages.

Java Database Applications

This course prepares students for taking the "Sun Certified Programmer for Java 2" exam. Students will also learn how to develop a Java database application, using JDeveloper for rapid application development. Approximately 6 weeks will be spent preparing for the syntax-and-rule-specific Java Certification exam.

Standard 1: Demonstrate knowledge of Java foundation classes. (1933.S.1)

Java Foundation Classes Objectives
Students will:
1933.1.1 Identify the five distinct parts of the JFC
1933.1.2 Demonstrate how Swing, AWT, and the JFC relate to each other.
1933.1.3 Identify the JFC-related packages, classes and interfaces.
1933.1.4 Use the Icon interface to annotate a component with an image.
1933.1.5 Establish a particular look and feel for a program's components.
1933.1.6 Implement a ToolTip to provide some simple, context-specific help.
1933.1.7 Develop borders around components.
1933.1.8 Use the four new Swing layouts.
1933.1.9 Recognize Swing event types and the new exception classes.
1933.1.10 Create a japplet.
1933.1.11 Create progress bars that display a current value.
1933.1.12 Present data in a two-dimensional format using tables.
1933.1.13 Create tabbed panes.
1933.1.14 Display data in a hierarchical structure using trees.
1933.1.15 Create split panes separated by a vertical or horizontal divider.
1933.1.16 Create pull-down menu items and attach them to a menu bar.
1933.1.17 Create mnemonics, or keyboard equivalents, and accelerators, keys pushed to activate the menu.
1933.1.18 Use event listeners to handle Action and Item events.
1933.1.19 Create popup menus and nested menus.
1933.1.20 Use Swing to create toolbar buttons for docked and floating toolbars.

Standard 2: Apply command line Applets. (1933.S.2)

Command Line Objectives
Students will:
1933.2.1 Write an applet using a subclass of the Applet class.
1933.2.2 Draw graphics with different colors and characters with different fonts.
1933.2.3 Identify the functions of the applet's execution methods.
1933.2.4 Load images and sounds in an applet.

Standard 3: Identify Applets and Jdeveloper. (1933.S.3)

Applets and Jdeveloper Objectives
Students will:
1933.3.1 Write an applet and embed it in an HTML page.
1933.3.2 Describe which methods are called by the browser, and when.
1933.3.3 Pass parameters into an applet from an HTML page.
1933.3.4 Deploy an applet using Jdeveloper.

Standard 4: Demonstrate Form Layout Manager. (1933.S.4)

Form Layout Manager Objectives
Students will:
1933.4.1 Write programs using the complex gridbag layout manager.
1933.4.2 Add swing containers to an application.
1933.4.3 Understand how layout managers operate.
1933.4.4 Write programs using the four basic layout manager types.
1933.4.5 Embed swing components into swing containers.
1933.4.6 Group swing components.

Standard 5: Demonstrate knowledge of Multithreading. (1933.S.5)

Multithreading Objectives
Students will:
1933.5.1 Distinguish between multithreading and multiprocessing.
1933.5.2 Design classes that extend the Thread class.
1933.5.3 Design applets that implement the Runnable interface.
1933.5.4 Avoid synchronization problems which can occur in multithreaded programs.
1933.5.5 Explain the basic concepts of multithreading.
1933.5.6 Create multiple threads.
1933.5.7 Use the synchronized keyword.
1933.5.8 Describe the life cycle of a thread.

Standard 6: Review for certification exam. (1933.S.6)

Certification Exam Objectives
Students will:
1933.6.1 Increase understanding of Java concepts.
1933.6.2 Become familiar with certification exam format and questions.

Standard 7: Access a database using JDBC. (1933.S.7)

JDBC Objectives
Students will:
1933.7.1 Describe the benefits of using Java and JDBC in conjunction with databases.
1933.7.2 Identify the package in the JDBC API that defines classes and interfaces for writing database applications in Java.
1933.7.3 Identify the importance of drivers to database connectivity and manipulation and the advantage of JDBC drivers.
1933.7.4 Identify Oracle JDBC drivers.
1933.7.5 Describe how Java can be used in all components of client-server and multitier database applications.
1933.7.6 Compare the use of Java in each component.
1933.7.7 Describe how Oracle8i and Oracle jserver implement each technology.
1933.7.8 Connect to a database.
1933.7.9 Write code to query and update a SQL database.
1933.7.10 Use stored procedures and precompiled statements.

Standard 8: Apply advanced JDBC topics and performance extensions. (1933.S.8)

Advanced JDBC Objectives
Students will:

1933.8.1 Define a JDBC driver and describe the Oracle JDBC drivers.
1933.8.2 Connect to a database using JDBC.

Java Programming

This course will provide the student with the fundamentals of Java programming, analysis, data types and operators, Jdeveloper, JavaApi, and how to control program flow.

Standard 1: Demonstrate knowledge of Java Programming Object-oriented Analysis. (1935.S.1)

Java Programming Objectives
Students will:
1935.1.1 Explain the principles and terminology of object oriented development.
1935.1.2 Apply a development process to move a project through analysis and design.
1935.1.3 Identify simple objects and classes.
1935.1.4 Describe relationships between objects.

Standard 2: Apply object-oriented analysis. (1935.S.2)

Analysis Objectives
Students will:
1935.2.1 Demonstrate the core concepts behind object-oriented programming: objects, methods, classes, and inheritance.
1935.2.2 Compare traditional project life cycles with iterative project life cycles.
1935.2.3 Describe the main activities of each phase in an OO project.
1935.2.4 Identify the popular tools currently available.
1935.2.5 List the strengths and weaknesses of Smalltalk, C++, and Java.
1935.2.6 Identify how they translate to code.
1935.2.7 Download and install the Java Development Kit. Set the PATH and CLASSPATH environment variables in a windows operating system.
1935.2.8 Begin to explore the Java API library.

Standard 3: Demonstrate knowledge of the Java language. (1935.S.3)

Java Language Objectives
Students will:
1935.3.1 Understand how the Java compiler, byte codes and Virtual Machine work together.
1935.3.2 Identify the ways in which Java is suited to network environments.
1935.3.3 Identify the components of the Java Software Development Kit (SDK) and their purpose.
1935.3.4 Identify the key elements of Java.
1935.3.5 Describe the Java Virtual Machine (JVM).
1935.3.6 Compare the use of Java for building applets and applications.
1935.3.7 Identify the key components of the Java Development Kit (JDK).
1935.3.8 Explain Java and the Oracle 8i database.
1935.3.9 Create a sample applet titled "Hello World".

Standard 4: Describe background object oriented programming working with classes and objects. (1935.S.4)

Background Object Objectives
Students will:
1935.4.1 Describe abstraction. Create an object-oriented hierarchy using "is-a" and "has-a" relationships.
1935.4.2 Describe object-oriented concepts: inheritance, encapsulation, polymorphism.
1935.4.3 Identify simple objects and classes.
1935.4.4 Identify internship possibilities and gather information about colleges supporting IT skills.

Standard 5: Define and use data types and operators. (1935.S.5)

Data Types and Operators Objectives
Students will:
1935.5.1 Describe primitive data types.
1935.5.2 Declare and initialize primitive variables.
1935.5.3 Use operators to manipulate the value in a primitive variable.
1935.5.4 Define and initialize arrays.
1935.5.5 Construct literal String values using quoted or unicode values.
1935.5.6 Identify when an object becomes eligible for garbage collection.

Standard 6: Demonstrate knowledge of Jdeveloper. (1935.S.6)

Jdeveloper Objectives
Students will:
1935.6.1 Create new workspaces, projects and applications.
1935.6.2 Build and execute Java applications
1935.6.3 Modify Java application source code.
1935.6.4 Demonstrate familiarity and develop comfort using jdeveloper design environment.
1935.6.5 Re-compile sample applications from previous sections.
1935.6.6 Research various colleges/universities that may offer additional IT courses.
1935.6.7 Identify businesses in local area that use Oracle software.

Standard 7: Apply controlling program flow techniques. (1935.S.7)

Flow Techniques Objectives
Students will:
1935.7.1 Use decision making constructs.
1935.7.2 Perform Loop operations through writing loops and nested loops.
1935.7.3 Write nested if/else and switch statements.
1935.7.4 Use logical operators in and identify valid arguments for if and switch statements.
1935.7.5 Use break and continue with and without labels.
1935.7.6 Debug an application using the Oracle developer debugger.

Standard 8: Discuss classes and objects as used in Java.

Java Objectives
Students will:
1935.8.1 Declare classes, instances of the classes and constants.
1935.8.2 Identify the two primary components make up the implementation of a class.
1935.8.3 Make appropriate use of the PUBLIC, PRIVATE and PROTECTED keywords.
1935.8.4 Write statements that declare a class, create instance variables of the given class and declare constants to store constant values.
1935.8.5 Implement nested classes.
1935.8.6 Determine the scope of a variable in a Java program.
1935.8.7 Identify the statement for casting primitive data types and object types.
1935.8.8 Copy the contents of an object to another object.
1935.8.9 Match the Math class methods with the values they return.

Standard 9: Discuss classes and objects as used in Java Api. (1935.S.9)

Java Api Objectives
Students will:

1935.9.1 Understand the organization of the Java Application Programming Interfaces (API).
1935.9.2 Recognize the packages that make up the Java Software Development Kit (SDK).
1935.9.3 Use the javadoc tool to generate API documentation from Java source files.
1935.9.4 Utilize the API documentation.
1935.9.5 Create new classes with Jdeveloper.
1935.9.6 Use packages to group related classes.
1935.9.7 Define instance variables and methods.
1935.9.8 Create objects and call methods.
1935.9.9 Declare fields and methods using the final and static modifiers.
1935.9.10 Understand how inner classes work.
1935.9.11 Use final and static to create constants.
1935.9.12 Define overloaded methods in a class.
1935.9.13 Provide constructors for a class.
1935.9.14 Use class variables and class methods where appropriate.
1935.9.15 Use initializers to initialize instance and class variables.

Standard 10: Demonstrate knowledge of datatypes/arrays. (1935.S.10)

Datatypes/Arrays Objectives
Students will:
1935.10.1 Define and initialize arrays.
1935.10.2 Construct literal String values using quoted or unicode values.
1935.10.3 Identify when an object becomes eligible for garbage collection.
1935.10.4 Apply all assignment, arithmetic, relational, bitwise, and logical operators.
1935.10.5 Understand how type conversion occurs when using operators.
1935.10.6 Create and manipulate strings in Java.
1935.10.7 Use wrapper classes to convert strings to primitives and primitives to strings.
1935.10.8 Implement resizable arrays - vectors.

Standard 11: Demonstrate the use of inheritance. (1935.S.11)

Inheritance Objectives
Students will:
1935.11.1 Define inheritance and use inheritance to define new classes.
1935.11.2 Explain how to use polymorphism in java classes.
1935.11.3 Identify when and how a default constructor is created for a class.
1935.11.4 Know how to use the instance of operator when casting class objects.
1935.11.5 Override methods in the superclass.

Standard 12: Identify abstract classes and interfaces. (1935.S.12)

Classes and Interfaces Objectives
Students will:
1935.12.1 Define abstract classes and abstract methods.
1935.12.2 Declare classes using the abstract modifier.
1935.12.3 Define and implement interfaces.

Standard 13: Apply knowledge of handling exceptions. (1935.S.13)

Handling Exceptions Objectives
Students will:
1935.13.1 Handle standard Java exceptions.
1935.13.2 Explain the basic concepts of exception handling.
1935.13.3 Write programs using try, catch and finally blocks.

1935.13.4 Create your own exception classes

Standard 14: Apply file input and output. (1935.S.14)

File Input and Output Objectives
Students will:
1935.14.1 Read from and write to the console.
1935.14.2 Create programs that read and write text and data files.
1935.14.3 Use Input and Output Streams.
1935.14.4 Write programs that operate on files and directories.
1935.14.5 List the contents of a directory.

Standard 15: Use the Java Foundation Class Abstract Window Toolkit. (1935.S.15)

Toolkit Objectives
Students will:
1935.15.1 Understand the use and organization of the AWT.
1935.15.2 Understand the relationship between the Abstract Window Toolkit (AWT) and the Java Foundation Classes (JFC).
1935.15.3 Use the Component and Container classes.
1935.15.4 Add Swing components to an application.
1935.15.5 Provide event handlers for common types of events.
1935.15.6 Write event handlers for different kinds of events.
1935.15.7 Determine when and how to use Event Adapters.
1935.15.8 Identify the cause of window events.
1935.15.9 Create buttons and labels.
1935.15.10 Write programs using textfields and Text Areas.
1935.15.11 Demonstrate how Text Component Events work.
1935.15.12 Explain parent and child components.
1935.15.13 Demonstrate the difference between the update(), paint() and repaint() methods.
1935.15.14 Use canvases to provide an area for drawing.
1935.15.15 Differentiate between the Graphics and Image classes.
1935.15.16 Use Frames.
1935.15.17 Create Menus and Dialog Boxes.
1935.15.18 Utilize Choice Menus and Scroll Bars.
1935.15.19 Manage the Font and fontmetrics classes.

Oracle-Database Fundamentals

This course is primarily conceptual, and covers the data requirements and business rules for the design of a relational database. As the first phase of the Academy curriculum, this course will provide the foundation for future software engineers or database administrators.

Standard 1: Provide an introduction to the Internet academy. (1937.S.1)

Internet Academy Objectives
Students will:
1937.1.1 Cite examples of jobs, salary, and opportunities a student will have as a result of Oracle certification.
1937.1.2 Describe the role a database plays in a business and predict its evolution.
1937.1.3 Demonstrate the difference between "data" and "information".
1937.1.4 Understand the importance of clear communication when discussing business information requirements.
1937.1.5 Experiment with web-based e-mail and explain how these services use a database.

Standard 2: Provide an overview of database development. (1937.S.2)

Database Development Objectives
Students will:
1937.2.1 Identify and analyze the phases of the Database Development Process.
1937.2.2 Explain what Conceptual Data Modeling and Database Design involve.
1937.2.3 Compare Database Development Process with that of the Application Development Process.

Standard 3: Demonstrate basic conceptual data modeling. (1937.S.3)

Basic Conceptual Data Modeling Objectives
Students will:
1937.3.1 Identify and model various types of entities.
1937.3.2 Identify naming and drawing conventions for entities.
1937.3.3 Sequence the steps that are necessary for creation of an entity.
1937.3.4 Analyze and model the relationships between entities.
1937.3.5 Analyze and model attributes.
1937.3.6 Identify unique identifiers for each entity.
1937.3.7 Develop an Entity Relationship diagram tagging attributes with optionally.
1937.3.8 Create models and ER diagrams from user information requirements and interviews.
1937.3.9 Begin to differentiate between One-to-Many, Many-to-Many and One-to-One relationships.
1937.3.10 Identify relationship between two entities by reading a given diagram.
1937.3.11 Create a relationship between instances of the same entity.
1937.3.12 Read an Entity Relationship Model in order to validate it.

Standard 4: Apply advanced conceptual data modeling. (1937.S.4)

Advanced Conceptual Data Modeling Objectives
Students will:
1937.4.1 Identify the significance of an attribute that has more than one value for each entity instance.
1937.4.2 Evaluate appropriate methods of storing validation rules for attributes.
1937.4.3 Recognize unique identifiers inherited from other entities.
1937.4.4 Sequence the steps involved in resolving a Many-to-Many relationship.
1937.4.5 Validate that an attribute is properly placed based upon its dependence on its entity's Unique Identifier (UID).

1937.4.6 Sequence the steps involved in resolving a Many-to-Many relationship.
1937.4.7 Validate that an attribute is properly placed based upon its dependence on its entity's Unique Identifier (UID).
1937.4.8 Resolve Many-to-Many relationships with intersection entities.
1937.4.9 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
1937.4.10 Create exclusive entities and relationships by using subtypes and arcs, respectively.
1937.4.11 Identify initial layout for presentation and generate a list of action items for members of group.

Standard 5: Apply advanced conceptual data modeling. (1937.S.5)

Advanced Conceptual Data Modeling Objectives
Students will:
1937.5.1 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
1937.5.2 Develop an ER Model using subtypes, supertypes and an exclusive arc.

Standard 6: Demonstrate adding complexity to an ERM. (1937.S.6)

Entity Relationship Model Objectives
Students will:
1937.6.1 Revise an Entity Relationship Model according to the diagramming techniques covered.
1937.6.2 Formulate reasons for holding historical data.
1937.6.3 Recognize and resolve Fan Traps and Chasm Traps.
1937.6.4 Differentiate between transferable and non-transferable relationships.
1937.6.5 Deliver a professional, formal business style presentation.
1937.6.6 Evaluate and critique presentation layout, design and performance.

Standard 7: Explain relational database concepts and initial database design. (1937.S.7)

Database Concepts and Design Objectives
Students will:
1937.7.1 Describe a relational database and how it is different from other databases.
1937.7.2 Define primary keys and foreign keys and their describe purpose.
1937.7.3 Describe what data integrity refers to and list some constraints.
1937.7.4 Explain how Database Design fits into the Database Development Process.
1937.7.5 Translate an Entity-Relationship Model into a relational database design.
1937.7.6 Document a database design using Table Instance charts.

Standard 8: Initial Database Design and Normalization (1937.S.8)

Design and Normalization Objectives
Students will:
1937.8.1 Demonstrate ability to implement 6 steps for mapping E-R Models.
1937.8.2 Document an initial database design on Table Instance Charts.
1937.8.3 Recognize raw data and evaluate the steps for creating a data group in unnormalized Form (UNF).

Standard 9: Demonstrate the technique of normalization. (1937.S.9)

Normalization Objectives
Students will:
1937.9.1 Differentiate between unnormalized data and normalized.
1937.9.2 Move data from an unnormalized form through to a Third Normal Form.

1937.9.3 Demonstrate ability to test data groups for Third Normal Form compliance.
1937.9.4 Identify optimized data groups from given groups of normalized data.
1937.9.5 Illustrate their personal folder using WebDB and altering the navigation bar, banner and content area.

Standard 10: Perform table normalization. (1937.S.10)

Table Normalization Objectives
Students will:
1937.10.1 Compare the Normalization and Entity Relationship Modeling (ERM) techniques in terms of strengths and weaknesses.
1937.10.2 Further define normalization and explain its benefits.
1937.10.3 Place tables in Third Normal Form.
1937.10.4 Explain how conceptual data modeling rules ensure normalized tables.
1937.10.5 Specify referential integrity constraints and design indices.

Standard 11: Review Data Modeling and Design and Introduction to WebDB (1937.S.11)

WebDB Objectives
Students will:
1937.11.1 Evaluate the transformation of business requirements into an initial layout and design for a database.
1937.11.2 Construct simple web page design for personal work folder.
1937.11.3 Evaluate existing web sites and determine quality of design.

Standard 12: Utilize WebDB and Building a Database Project. (1937.S.12)

Building A Database Project Objectives
Students will:
1937.12.1 Formulate a plan of action for a Database Project.
1937.12.2 Normalize an ERM to the Third Normal Form (TNF).
1937.12.3 Create a table in the database using webdb.
1937.12.4 Demonstrate ability to edit tables using webdb.
1937.12.5 Create forms that will display the table components created with webdb.

Standard 13: Work on database projects. (1937.S.13)

Database Projects Objectives
Students will:
1937.13.1 Create a website that displays the Database Project home using webdb.
1937.13.2 Link the web site to create a web-enabled interface to an Oracle database.
1937.13.3 Edit the forms created with webdb and specify appropriate field labels for data entry.
1937.13.4 Evaluate and generate criteria for a formal, business presentation.
1937.13.5 Construct a persuasive group presentation using the guidelines set forth in class.

Standard 14: Perform database presentations. (1937.S.14)

Perform Database Presentations Objectives
Students will:
1937.14.1 Deliver a formal business presentation for the class that discusses an Entity-Relationship Model and Initial Database Design.
1937.14.2 Demonstrate the functionality of the database and the layout/design capabilities of webdb.

Floriculture

Floriculture introduces students to careers in the floral industry and provides basic instruction in the techniques of floral design and merchandising.

Standard 1: Demonstrate leadership and communication skills. (1941.S.1)

Leadership and Communication Skills Objectives
Students will:
1941.1.1 Utilize record-keeping skills in work-based experience programs (SAE).
1941.1.2 Identify appropriate career opportunities in the floriculture industry.
1941.1.3 Draft and prepare a resume, fill out a job application, demonstrate employability skills.
1941.1.4 Develop personal relation and communication skills.
1941.1.5 Describe employment and floriculture industry ethics.

Standard 2: Utilize principles of design to critique floral designs. (1941.S.2)

Floral Designs Objectives
Students will:
1941.2.1 Utilize floriculture principles, elements and theory of design.
1941.2.2 Identify basic designs and arrangements associated with floriculture principles of design.
1941.2.3 Explain the concepts and use of color.

Standard 3: Identify and maintain cut flowers and greens. (1941.S.3)

Cut Flowers and Greens Objectives
Students will:
1941.3.1 Identify and classify flowers and foliage.
1941.3.2 List the techniques to maintain optimum flower and foliage quality.

Standard 4: Manipulate floral materials and supplies. (1941.S.4)

Floral Materials and Supplies Objectives
Students will:
1941.4.1 Identify the basic mechanics and supplies used in floral design.
1941.4.2 Identify materials to wire flowers for corsages, arrangements and wreaths.
1941.4.3 Demonstrate construction of bows.

Standard 5: Design product in selected specialty areas. (1941.S.5)

Specialty Areas Objectives
Students will:
1941.5.1 Design boutonnieres and corsages.
1941.5.2 Identify concepts in floral design of holiday arrangements.
1941.5.3 Identify designs for weddings and receptions.
1941.5.4 Recognize practice in sympathy floral designs.
1941.5.5 Dry and preserve flowers and foliage to make a dried flower presentation.
1941.5.6 Explain appropriate indoor planting schemes, construction and maintenance.

Standard 6: Develop floral operations and management strategies. (1941.S.6)

Floral Operations and Management Strategies Objectives

Students will:

1941.6.1 Develop skills in retail sales using various selling techniques.
1941.6.2 Develop a visual merchandising plan to project the right image.
1941.6.3 Identify the components and the importance of a floral delivery system.
1941.6.4 Identify professional trade organizations organized to assist the retail florist.

Greenhouse Technology

This area of study is designed to provide both college bound students and work bound students with the basic skills and knowledge needed in the greenhouse management industry. Major instructional concepts include: plant environments, classification, plant processes, growing media, plant nutrients, propagation, growth, pests and management procedures, nursery and landscape techniques, structures operation and maintenance and advanced greenhouse practice and technologies.

Standard 1: Demonstrate leadership development (1943.S.1)

Leadership Development Objectives
Students will:
1943.1.1 Utilize record-keeping skills in work-based experience programs.
1943.1.2 Develop and exhibit communication skills.
1943.1.3 Draft and complete a resume, complete a job application, and demonstrate job seeking/keeping skills.
1943.1.4 Demonstrate personal and social skills.
1943.1.5 Research career opportunities in the greenhouse management industry.

Standard 2: Identify greenhouse designs, operation and maintenance. (1943.S.2)

Greenhouse Objectives
Students will:
1943.2.1 Identify different greenhouse parts and compare types of structures and coverings.
1943.2.2 Demonstrate safety and proper manipulation of greenhouse equipment.
1943.2.3 Diagram operational systems in the greenhouse operation.
1943.2.4 Analyze suitable greenhouse locations and recommend interior layout.

Standard 3: Develop plant classification and identification skills. (1943.S.3)

Plant Classification and Identification Skills Objectives
Students will:
1943.3.1 Describe the natural classification system for the plant kingdom.
1943.3.2 Identify and research plants that are important to the greenhouse industry.

Standard 4: Develop skill in environmental control and plant growth. (1943.S.4)

Environmental Control And Plant Growth Objectives
Students will:
1943.4.1 Describe the plant processes involved with plant growth and development.
1943.4.2 List plant growth regulators and document their effects on plants.
1943.4.3 Explain how essential elements become available for plant use.
1943.4.4 Identify and document the effects of environmental factors on plant growth.

Standard 5: Identify greenhouse media and containers. (1943.S.5)

Greenhouse Media and Containers Objectives
Students will:
1943.5.1 Research the components of media and amendments.
1943.5.2 Demonstrate the effect of various greenhouse media and proper media preparation on plant growth.
1943.5.3 Compare and contrast basic types and sizes of containers used in greenhouse management.

Standard 6: Identify plant processes and propagation. (1943.S.6)

Plant Processes and Propagation Objectives
Students will:
1943.6.1 Perform methods of propagating plants.
1943.6.2 Manipulate total environment from juvenile to mature plant.
1943.6.3 Describe plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 7: Identify and control disease, insects, and weeds. (1943.S.7)

Control Disease, Insects and Weeds Objectives
Students will:
1943.7.1 Identify and exhibit guidelines for pesticide use.
1943.7.2 Practice integrated pest management procedures.
1943.7.3 Describe and evaluate control methods, chemical formulations and equipment used to control pests in the greenhouse.

Standard 8: Develop skills in greenhouse business management. (1943.S.8)

Greenhouse Business Objectives
Students will:
1943.8.1 Explore and discuss the various types of records kept in a greenhouse business.
1943.8.2 Use computers to solve problems related to greenhouse management.
1943.8.3 Describe the methods and determine the values and limitations of effective advertising.
1943.8.4 Develop a plan for profitable sales techniques.
1943.8.5 Record receipts and expenditures.

Standard 9: Safely conduct laboratory investigation. (1943.S.9)

Conduct Laboratory Investigation Objectives
Students will:
1943.9.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.
1943.9.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).
1943.9.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.
1943.9.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 10: Apply technology to real world problems in greenhouses. (1943.S.10)

Technology in Greenhouses Objectives
Students will:
1943.10.1 Use computers and the World Wide Web (WWW) to solve problems related to work-based experience programs in greenhouses, locate, evaluate, and collect information from a variety of sources related to greenhouse technology, develop positive attitude, support lifelong learning, collaboration, personal pursuits, and productivity.
1943.10.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.
1943.10.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to greenhouse technology.
1943.10.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of greenhouse technology.

Standard 11: Demonstrate process/workplace skills. (1943.S.11)

Process/Workplace Skills Objectives

Students will:

1943.11.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1943.11.2 Explore careers available in greenhouse technology.

1943.11.3 Use a variety of sources to investigate the educational requirements of various careers in greenhouse technology.

1943.11.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1943.11.5 Demonstrate correct language usage in all oral and written work.

1943.11.6 Perform effectively in both leadership and non-leadership roles.

1943.11.7 Evaluate information for reliability, completeness, and applicability to various assignments.

1943.11.8 Participate as a team member to complete a variety of assignments.

Horticulture

Horticulture includes art, science and technology. This field of study explains concepts of plant growth and how plants are used in our environment for aesthetics, ecosystems and as plant products for human consumption. Students will gain skills for entry-level employment or entrance into an advanced training/degree program.

Standard 1: Demonstrate leadership development. (1945.S.1)

Leadership Development Objectives
Students will:
1945.1.1 Participate in a student organization and its components.
1945.1.2 Utilize record-keeping skills in work-based experience programs.
1945.1.3 Develop and exhibit communication skills.
1945.1.4 Draft and complete a resume, complete a job application, and demonstrate job seek/keep skills.
1945.1.5 Demonstrate personal and social skills.
1945.1.6 Research career opportunities in the greenhouse management industry.

Standard 2: Perform plant classification and identification. (1945.S.2)

Plant Classification And Identification Objectives
Students will:
1945.2.1 Describe the natural classification system for the plant kingdom.
1945.2.2 Identify plant species and explore their benefit to people.
1945.2.3 Identify and research plants that are important to the greenhouse industry.
1945.2.4 Describe the plant processes involved with plant growth and development.
1945.2.5 List plant growth regulators and document their effects on plants.
1945.2.6 Explain how essential elements become available for plant use.
1945.2.7 Identify and document the effects of environmental factors on plant growth.
1945.2.8 Compare and contrast types of plant-growing media.
1945.2.9 Determine appropriate amendments for optimum plant growth.
1945.2.10 Explain and utilize soil and water conservation practices.

Standard 3: Identify levels of plant processes and propagation. (1945.S.3)

Plant Processes And Propagation Objectives
Students will:
1945.3.1 Perform methods of propagating plants.
1945.3.2 Manipulate total environment from juvenile to mature plant.
1945.3.3 Identify plant growth and propagation processes including photosynthesis, respiration, transpiration and pollination.

Standard 4: Perform pest management. (1945.S.4)

Pest Management Objectives
Students will:
1945.4.1 Explain and apply the concepts of integrated pest management.
1945.4.2 Identify safety guidelines for tools, equipment and pesticide use.
1945.4.3 Identify pests and evaluate control methods according to label interpretation.
1945.4.4 Recognize, calibrate and operate pesticide application equipment
1945.4.5 Research and discuss the environmental and health concerns relating to pesticide usage.
1945.4.6 Interpret federal and state pesticide laws.

Standard 5: Identify the various specialty areas in horticulture. (1945.S.5)

Horticulture Objectives

Students will:

1945.5.1 Explore professions in floriculture and understand the scope of job opportunities.

1945.5.2 Demonstrate various techniques and procedures commonly used in the floriculture industry.

1945.5.3 Explore professions in greenhouse management and understand the scope of job opportunities.

1945.5.4 Demonstrate various techniques and procedures commonly used in the greenhouse management industry.

1945.5.5 Explore professions in nursery production and understand job requirements.

1945.5.6 Demonstrate techniques and procedures used in the nursery production industry.

1945.5.7 Research careers in the landscape and turf industry.

1945.5.8 Perform basic landscape design, plantings and maintenance tasks.

1945.5.9 Utilize Internet World Wide Web to explore specialty areas in horticulture.

Standard 6: Safely conduct laboratory investigation. (1945.S.6)

Laboratory Investigation Objectives

Students will:

1945.6.1 Engage in active inquiries, investigations, and hands-on activities a minimum of 50 percent of the time.

1945.6.2 Conduct explorations in a variety of environments (e.g., laboratories, libraries, parks, and other outdoor locations).

1945.6.3 Properly and safely manipulate equipment, materials, chemicals, organisms, and models.

1945.6.4 Use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research.

Standard 7: Apply technology to real world problems in horticulture. (1945.S.7)

Technology Objectives

Students will:

1945.7.1 Use computers and the World Wide Web (WWW) to solve problems related to experience programs in horticulture, locate, evaluate, and collect information from a variety of sources related to horticulture, develop a positive attitude toward technology, support lifelong learning, collaboration, personal pursuits, and productivity.

1945.7.2 Demonstrate skills in word processing and the use of databases, spreadsheets, graphics and telecommunications.

1945.7.3 Use TV/satellite, VCR and Laser discs/DVD to retrieve information to complete classroom assignments related to horticulture.

1945.7.4 Use cameras and/or camcorders to record activities and progress of special projects in the area of horticulture.

Standard 8: Demonstrate process/workplace skills. (1945.S.8)

Process/Workplace Skills Objectives

Students will:

1945.8.1 Use computers and other electronic technologies to access, gather, store, retrieve, organize, analyze, and report data.

1945.8.2 Explore careers available in horticulture.

1945.8.3 Use a variety of sources to investigate the educational requirements of various careers in horticulture.

1945.8.4 Analyze problems, state causes and effects, and plan, organize, and implement a solution to the problem or a concept to improve the situation or process.

1945.8.5 Demonstrate correct language usage in all oral and written work.
1945.8.6 Perform effectively in both leadership and non-leadership roles.
1945.8.7 Evaluate information for reliability, completeness, and applicability to various assignments.
1945.8.8 Participate as a team member to complete a variety of assignments.

Landscape Design and Installation

This course will prepare students to design appropriate landscapes for home, business and other facilities. After the design plan is formulated, Students will: implement the plan.

Standard 1: Demonstrate leadership and interpersonal skills. (1947.S.1)

Leadership and Interpersonal Skills Objectives
Students will:
1947.1.1 Write, deliver and evaluate a speech and/or presentation.
1947.1.2 Explore careers in the landscape industry.
1947.1.3 Determine appropriate job seeking and keeping skills.
1947.1.4 Describe ethical conduct.
1947.1.5 Use record-keeping skills in work-based experience programs.

Standard 2: Recognize basic landscape design. (1947.S.2)

Landscape Design Objectives
Students will:
1947.2.1 Determine environmental requirements for landscape plant materials.
1947.2.2 Recognize the appropriate plants for landscape use.
1947.2.3 Interpret landscape symbols for a landscape plan.
1947.2.4 Operate computer assisted design programs.
1947.2.5 Demonstrate drafting skills needed in a landscape plan.

Standard 3: Use safety in operation of horticulture tools and equipment. (1947.S.3)

Horticulture Tools and Equipment Objectives
Students will:
1947.3.1 Identify and properly use horticulture tools and equipment.
1947.3.2 Follow appropriate safety procedures and policies.
1947.3.3 Interpret and follow safety information from equipment manuals.
1947.3.4 Maintain and adjust safety devices.
1947.3.5 Service tools and equipment as to manufactures specifications.
1947.3.6 Operate equipment under job site conditions.

Standard 4: Implement principles of landscape design. (1947.S.4)

Principles of Landscape Design Objectives
Students will:
1947.4.1 Prepare an area to be landscaped.
1947.4.2 Construct walkways and landscape structures.
1947.4.3 Install balled and burlapped, containerized and bare root plantings.
1947.4.4 Install herbaceous landscape plants.
1947.4.5 Place edging materials.
1947.4.6 Mulch a landscape site.
1947.4.7 Install turf areas.
1947.4.8 Place planting to provide appropriate lighting.

Landscape Maintenance

Landscape maintenance is designed to expose students to proper techniques for maintaining a well-designed landscape. Students will: understand the importance of landscape maintenance from the added aesthetic and financial value of the property.

Standard 1: Demonstrate leadership and interpersonal skills. (1949.S.1)

Leadership and Interpersonal Skills Objectives
Students will:
1949.1.1 Identify communication skills.
1949.1.2 Identify interview and employment readiness skills.
1949.1.3 Draft a resume.

Standard 2: Demonstrate safe use and operation of horticulture tools and equipment. (1949.S.2)

Horticulture Tools and Equipment Objectives
Students will:
1949.2.1 Identify and properly use horticulture tools and equipment.
1949.2.2 Follow appropriate safety procedures and policies.
1949.2.3 Interpret and follow safety information from equipment manuals.
1949.2.4 Maintain and adjust safety devices.
1949.2.5 Service tools and equipment as to manufacturer's specifications (including winterizing).
1949.2.6 Operate equipment under job site conditions.
1949.2.7 Identify and demonstrate the safe use of potentially hazardous materials (fuels, lubricants, etc.)

Standard 3: Practice safe use of pest management techniques. (1949.S.3)

Pest Management Objectives
Students will:
1949.3.1 Identify, calibrate, and properly use equipment.
1949.3.2 Identify and use personal safety equipment and protective clothing.
1949.3.3 Identify pests and tbe appropriate control techniques.
1949.3.4 Introduce Integrated Pest Management (IPM) techniques.
1949.3.5 Interpret pesticide labels and proper use as instructed.
1949.3.6 Identify and maintain an insect, disease, and weed control program.

Standard 4: Practice proper landscape maintenance techniques. (1949.S.4)

Landscape Objectives
Students will:
1949.4.1 Determine and follow appropriate lawn care practices.
1949.4.2 Aerate and dethatch turf areas.
1949.4.3 Determine and implement irrigation needs for turf and landscaped areas.
1949.4.4 Identify appropriate soil testing procedures.
1949.4.5 Over-seed, lime, and fertilize as deemed necessary.
1949.4.6 Determine and implement proper pruning timelines and practices.
1949.4.7 Maintain landscape edging materials.
1949.4.8 Mulch landscape planting.
1949.4.9 Maintain landscape structures.
1949.4.10 Describe appropriate winter protection.

ProStart I

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete 400 hour off-campus, paid internship. This first course focuses on the basics of preparing and service safe food, preventing accidents, using foodservice equipment and preparing certain types of foods. It also addresses the business topics of human relations, customer service, controlling costs and certain math concepts.

Standard 1: Prepare for a successful career in foodservice management. (1951.S.1)

Foodservice Management Objectives
Students will:

1951.1.1 Recognize how the foodservice industry provides a unique workplace environment.
1951.1.2 Describe the importance of service to success in foodservice
1951.1.3 Describe the elements of excellent service.
1951.1.4 Identify ways to speak to customers and coworkers.
1951.1.5 Identify career opportunities within the foodservice industry.
1951.1.6 Describe the steps in looking for a job.
1951.1.7 Complete the necessary documents for a job interview including the resume, cover letter, and application.
1951.1.8 Participate in a job interview.

Standard 2: Prepare and serve safe food. (1951.S.2)

Safe Food Objectives
Students will:

1951.2.1 Demonstrate proper sanitary procedures for use in food service.
1951.2.2 Show how contamination and cross-contamination is most likely to occur.
1951.2.3 List the major causes of foodborne illnesses, and describe potentially hazardous foods.
1951.2.4 Describe the micro-organisms that cause foodborne illnesses and the conditions in which they thrive.
1951.2.5 Demonstrate safe and proper procedures for receiving, storing, preparing, holding, and serving food.
1951.2.6 Describe ways to prevent infestation by pests.

Standard 3: Practice safe workplace habits. (1951.S.3)

Safe Workplace Objectives
Students will:

1951.3.1 Demonstrate proper safety procedures commonly used in foodservice operations.
1951.3.2 Describe the role of OSHA regulations and explain the Hazard Communication Standard requirements for employers.
1951.3.3 Demonstrate proper procedures for reducing accidents involving fire, slips, trips, falls, lifting and carrying, cuts and equipment.

Standard 4: Demonstrate the basics food preparation. (1951.S.4)

Food Preparation Objectives

Students will:

1951.4.1 Describe the various liquid and dry cooking methods and the foods to which they are best suited.

1951.4.2 Read and follow standardized recipes, describing their components and functions, and convert them to smaller and larger quantities.

1951.4.3 Explain the functions of different types of knives and demonstrate their proper use.

1951.4.4 Identify the tools commonly used in food service for wet and dry measure and demonstrate understanding of equivalence of standard American and metric measures.

1951.4.5 Define common cooking and foodservice terms.

Standard 5 :Operate foodservice equipment safely and effectively. (1951.S.5)

Foodservice Equipment Objectives

Students will:

1951.5.1 List and describe the equipment commonly used in the receiving, storage, food preparation, baking, holding and service, bar, dishwashing and waste disposal areas.

1951.5.2 List and describe the measuring utensils, hand tools, knives, pots and pans commonly used in a food service operation.

1951.5.3 Discuss how to troubleshoot the maintenance and repair of mixers, slicers, steamers, broilers, ranges, grills, fryers, ovens, food warmers, coffee urns, dishwashers and waste disposal systems.

1951.5.4 Discuss the role of the health inspector and how managers get ready for inspections.

Standard 6: Discuss the role of nutrition in a food service operations. (1951.S.6)

Nutrition in Food Service Operations Objectives

Students will:

1951.6.1 Explain the role of Recommended Dietary Allowances (RDAs) and the Food Guide Pyramid planning healthful meals.

1951.6.2 Plan interesting, appealing and nutritionally balanced meals.

1951.6.3 Demonstrate cooking methods and identify recipes that preserve nutrients in quantity cooking.

Standard 7: Prepare sandwiches and breakfast foods. (1951.S.7)

Sandwiches and Breakfast Foods Objectives

Students will:

1951.7.1 Explain the roles of the production sheet, daily food cost sheet, sales history, and sales mix record in quantity food production.

1951.7.2 Perform total food cost and food cost percentage calculations.

1951.7.3 Determine the total cost and portion cost of standardized recipes.

1951.7.4 Explain the roles of the three components of a sandwich: bread, spread and filling.

1951.7.5 Compare and contrast the various types of sandwich: simple hot, open-faced, deep-fried, simple cold, tea and canapé.

1951.7.6 Set up a safe, sanitary, and efficient sandwich station.

1951.7.7 List the various forms in which milk is available and define pasteurize and homogenize.

1951.7.8 Compare and contrast current, aged, and processed cheeses and give examples of each.

1951.7.9 Describe the methods for cooking eggs: boiled, baked, shirred, poached, fried, scrambled, deviled, omelet, quiche, and soufflé.

1951.7.10 Prepare common breakfast food: pancakes and similar foods, eggs, breakfast cereals and breakfast meats.

Standard 8: Prepare salads and garnishes. (1051.S.8)

Salads and Garnishes Objectives
Students will:
1951.8.1 Discuss characteristic of the various ingredients that can be used to make both common and unusual salads.
1951.8.2 Prepare and store salads properly.
1951.8.3 Demonstrate techniques used to prepare garnishes
1951.8.4 Discuss common salad dressings and condiments.

Standard 9: Understand personnel management techniques. (1951.S.9)

Personnel Management Techniques Objectives
Students will:
1951.9.1 Demonstrate quality customer service techniques.
1951.9.2 Describe the elements involved in staff planning, recruiting, interviewing, and selecting employees
1951.9.3 Discuss effective methods of motivating and retaining employees
1951.9.4 Show techniques used to conduct and effective employee evaluation.

Standard 10: Prepare fruits and vegetables. (1951.S.10)

Fruits and Vegetables Objectives
Students will:
1951.10.1 Describe and identify the various varieties of fruits and vegetables and the forms in which they are available (fresh, frozen etc.).
1951.10.2 List seasons in which fresh fruits and vegetables are at their best quality and lowest price.
1951.10.3 Match different cooking methods to various fruits and vegetables.
1951.10.4 Explain how to properly select and purchase, receive, store, and handle fruits and vegetables.
1951.10.5 Prepare fruits and vegetables in a variety of ways.

Standard 11: Control food service costs. (1951.S.11)

Food Service Costs Objectives
Students will:
1951.11.1 Perform basic math operations as they relate to foodservice operations: i.e., determine percentages, convert recipes, convert form American and metric units of measure, approximate recipe yields.
1951.11.2 Describe different types of costs related to food, beverage and labor: controlled costs, fixed costs, variable costs, etc.
1951.11.3 Demonstrate operational procedures for preventing waste of food ad beverage.
1951.11.4 Show proper use of recipes, glassware, utensils, production sheets and other tools that help control waste.
1951.11.5 Determine menu prices using various methods.
1951.11.6 Illustrate the cost percentage formula and apply it to operational procedures.
1951.11.7 Describe and apply procedures used in planning and forecasting to control food, beverage and labor costs.

ProStart II

ProStart is a two-course foodservice curriculum developed by the Educational Foundation of the National Restaurant Association with input from thousands of foodservice professionals across the nation. The courses integrate academic and hands-on learning to provide an overview of the industry and competencies necessary for success in the foodservice industry. Completers of the ProStart program are eligible for a national certificate from the National Restaurant Association Educational Foundation. Students must pass rigorous tests at the end of each course and complete a 400 hour off-campus, paid internship. This second course focuses on the basics of quality table service, menu planning, industry careers and preparing certain types of foods. It also addresses the business topics of marketing, communication, accounting, purchasing, and inventory control.

Standard 1: Prepare Potatoes, Grains and Pasta (1952.S.1)

Prepare Potatoes, Grains and Pasta Objectives
Students will:

1952.1.1 Explain how to properly select, receive, and store potatoes, grains and pasta.
1952.1.2 Match different cooking methods to potatoes, grains and pasta.
1952.1.3 Prepare potatoes, grains and pasta using a variety of recipes and cooking techniques.

Standard 2: Explain the characteristics, activities, opportunities and types of lodging operations. (1952.S.2)

Lodging Operations Objectives
Students will:

1952.2.1 Define the term "lodging property" and discuss each of the characteristic types of lodging operations.
1952.2.2 List and discuss the five key elements that differentiate one lodging establishment from another.
1952.2.3 Identify the two national organizations that rate commercial lodging establishments and list a minimum of five factors used by each in making their judgments.
1952.2.4 Identify ten services offered by some, but not all, lodging properties.
1952.2.5 Discuss career opportunities in the lodging industry and the qualifications commonly sought by lodging employers.
1952.2.6 Name the activities generally accomplished at the front desk, in housekeeping, in the front office and by engineering.
1952.2.7 Describe the different types of rates and what makes them different.

Standard 3: Demonstrate the techniques necessary for quality table service. (1952.S.3)

Table Service Objectives
Students will:

1952.3.1 Set a table properly for guests arrival.
1952.3.2 Set and clear items properly.
1952.3.3 Demonstrate different service styles: American, French, English, Russian, buffet, counter and cafeteria.
1952.3.4 Describe the traditional service staff and the duties and responsibilities of each staff position.
1952.3.5 Present a guest check, receive payment, and say good-bye to guest properly.
1952.3.6 Identify various dining utensils.
1952.3.7 Perform several tableside service and food preparation techniques.
1952.3.8 Show how servers should properly identify, describe and recommend menu items to guests.

Standard 4: Prepare desserts and baked goods. (1952.S.4)

Desserts and Baked Goods Objectives
Students will:
1952.4.1 Identify the functions of basic ingredients used in desserts and breads.
1952.4.2 Describe common desserts and methods used to prepare them.
1952.4.3 Prepare various desserts and baked goods and store them properly.
1952.4.4 Bake different types of breads and quick breads.

Standard 5: Plan an effective menu. (1952.S.5)

Menu Objectives
Students will:
1952.5.1 Characterize various menu types - a la carte, table d'hôte, California, du jour, cycle - and the operations in which they are most commonly used.
1952.5.2 Write descriptions of menus items using appetizing language.
1952.5.3 Critique the physical layout of a menu.

Standard 6: Describe how marketing techniques are used in food service. (1952.

Marketing Techniques Objectives
Students will:
1952.6.1 Describe the basic marketing concepts and terms.
1952.6.2 Describe the elements of a marketing plan.
1952.6.3 Describe elements of successful community and public relations.
1952.6.4 Write and effective press release. LA
1952.6.5 Explain the various advertising media and advantages and disadvantages of each.
1952.6.6 Plan a successful promotional campaign using commonly used professional tools.

Standard 7: Practice appropriate purchasing and inventory control procedures. (1952.S.7)

Purchasing and Inventory Control Objectives
Students will:
1952.7.1 Determine when and how often to order inventory items using both perpetual and physical inventory methods
1952.7.2 Prepare purchase specifications and purchase orders for items to be purchased.
1952.7.3 Explain the formal bidding process.
1952.7.4 Describe the factors involved in selecting appropriate suppliers.
1952.7.5 Describe proper receiving procedures.
1952.7.6 Explain procedures used to issue items and keep track of inventory.

Standard 8: Prepare meats, poultry and seafood. (1952.S.8)

Meats, Poultry and Seafood Objectives
Students will:
1952.8.1 Explain the federal grading systems for meat, poultry, fish and shellfish.
1952.8.2 Describe the various forms of meat, poultry, fish and shellfish.
1952.8.3 Discuss proper procedures for receiving, storing, and handling meat, poultry, fish and shellfish.
1952.8.4 Prepare meat, poultry, fish and shellfish using a variety of cooking methods and recipes.

Standard 9: Use Standard Accounting Practices. (1952.S.9)

Accounting Objectives

Students will:

1952.9.1 Demonstrate basic accounting principles and apply them to common foodservice scenarios.
1952.9.2 Practice double-entry accounting (recording transactions in balanced T accounts).
1952.9.3 Read and interpret income statements and balance sheets
1952.9.4 Calculate cost of sales using opening and closing inventory figures.
1952.9.5 Use the balance sheet equation to determine assets, liabilities and owners equity.

Standard 10: Prepare soups, stocks and sauces. (1952.S.10)

Soups, Stocks and Sauces Objectives

Students will:

1952.10.1 List the common ingredients of and describe the proper procedure for, making a quality stock.
1952.10.2 Prepare a stock.
1952.10.3 Describe common soups and how they are prepared.
1952.10.4 Prepare various soups.
1952.10.5 Identify the major sauce families and the sauces derived from them.
1952.10.6 Prepare quality sauces using proper procedures.

Standard 11: Describe the characteristics, components and opportunities of the tourism industry. (1952.S.11)

Tourism Objectives

Students will:

1952.11.1 Describe the role of travel and tourism in the hospitality industry.
1952.11.2 Recognize career opportunities offered in travel and tourism.
1952.11.3 Distinguish the segments that make up the travel industry.
1952.11.4 Describe the kinds of customer service skills required of people who work in the travel industry.

Standard 12: Communicate well with customers. (1952.S.12)

Communications Objectives

Students will:

1952.12.1 Display basic speaking and listening skills.
1952.12.2 Use effective writing skills in all forms of written communications.
1952.12.3 Display proper and courteous telephone skills.
1952.12.4 Describe menu items effectively and demonstrate suggestive selling techniques.

Standard 13: Complete a 400-hour, off-campus, paid internship in a food service establishment. (1952.S.13)

Internship Objectives:

Students will:

1952.13.1 Develop personal qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1952.13.2 Develop long-term work qualities and skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.
1952.13.3 Develop short-term observable skills necessary for success in the food service industry as described in the ProStart workplace competency checklist.

Small Engine Fundamentals

Content Standards for this course are under development. (1961)

Small Engine Maintenance

Content Standards for this course are under development. (1963)

Small Engine Servicing and Care

Content Standards for this course are under development. (1965)

Troubleshooting Motorcycles and ATV,s I

Content Standards for this course are under development. (1967)

Troubleshooting Motorcycles and ATV,s II

Content Standards for this course are under development. (1969)

Troubleshooting Small Engine Systems

Content Standards for this course are under development. (1971)

Arc Welding

This course will give students the opportunity to advance their skills in SMAW, GMAW, FCAW, GTAW and to have the opportunity to test to a sate or national standard.

Standard 1: Perform advanced Shielded Metal Arc Welding (SMAW) processes. (1981.S.1)

Shielded Metal Arc Welding Objectives
Students will:
1981.1.1 Perform safety inspections of equipment and accessories.
1981.1.2 Make minor external repairs to equipment and accessories.
1981.1.3 Set up for shielded metal arc welding operations.
1981.1.4 Operate shielded metal arc welding equipment.
1981.1.5 Execute corrective actions to repair surface flaws on welds areas and base metals.
1981.1.6 Make fillet welds, all positions, on plain carbon steel or stainless steel plate using stainless steel electrodes.
1981.1.7 Make groove welds, all positions, on plain carbon steel or stainless steel using stainless steel electrodes.
1981.1.8 Make groove welds, all positions, according to AWS D1.1 Code.
1981.1.9 Make fillet welds, all positions, on carbon steel pipe.
1981.1.10 Prepare test coupons according to AWS D1.1 Code.

Standard 2: Apply advanced Gas Metal Arc Welding (GMAW) procedures. (1981.S.2)

Gas Metal Arc Welding Objectives
Students will:
1981.2.1 Perform safety inspections of equipment and accessories.
1981.2.2 Make minor external repairs to equipment and accessories.
1981.2.3 Set up for gas metal arc welding operations on carbon steel.
1981.2.4 Operate gas metal arc welding equipment.

Standard 3: Perform Spray Transfer processes. (1981.S.3)

Spray Transfer Objectives
Students will:
1981.3.1 Make fillet welds, all positions, on aluminum plate.
1981.3.2 Make groove welds, all positions, on aluminum plate.

Standard 4: Utilize Short Circuiting Transfer process. (1981.S.3)

Short Circuiting Transfer Objectives
Students will:
1981.4.1 Make fillet welds, all positions, on carbon steel pipe, using short circuiting transfer.
1981.4.2 Make groove welds, all positions, using short circuiting transfer to the AWS D1.1 Code.
1981.4.3 Prepare test coupons according to AWS D1.1 Code.

Standard 5: Utilize Flux Cored Arc Welding (FCAW-S, FCAW-G) processes. (1981.S.5)

Flux Cored Arc Welding Objectives
Students will:
1981.5.1 Perform safety inspections of equipment and accessories.
1981.5.2 Make minor external repairs to equipment and accessories.
1981.5.3 Set up for flux cored arc welding operations on carbon steel.

1981.5.4 Operate flux cored arc welding equipment.
1981.5.5 Make fillet welds, all positions, on carbon steel pipe, using gas-shielded electrodes.
1981.5.6 Make groove welds, all positions, according to the AWS D1.1 Code.
1981.5.7 Prepare test coupons according to AWS D1.1 Code.

Standard 6: Perform Gas Tungsten Arc Welding (GTAW). (1981.S.6)

Gas Tungsten Arc Welding Objectives
Students will:
1981.6.1 Perform safety inspections of equipment and accessories.
1981.6.2 Make minor external repairs to equipment and accessories.
1981.6.3 Set up for gas tungsten arc welding operations on carbon steel, aluminum, and stainless steel.
1981.6.4 Operate gas tungsten arc welding equipment.
1981.6.5 Make fillet welds, all positions, on aluminum.
1981.6.6 Make groove welds, all positions, on aluminum.
1981.6.7 Make fillet welds, all positions, on stainless steel.
1981.6.8 Make groove welds, all positions, on stainless steel.

Blueprint Reading and Metallurgy

This course will introduce students to the basic fundamentals of blueprint reading as it relates to the welding industry, and to the science and technology of extracting metals from their ores, refining them, and preparing them for use.

Standard 1: Determine processing requirements from drawings. (1983.S.1)

Drawings Objectives
Students will:
1983.1.1 Identify the types of lines used on blueprints.
1983.1.2 Describe various methods of dimensioning a welding blueprint.
1983.1.3 Differentiate between notes and specifications.
1983.1.4 Analyze processing requirements from information block.
1983.1.5 Explain what tolerances are, and why they are used on blueprints.
1983.1.6 Read a drawing and write a bill of materials.

Standard 2: Draw shop and field sketches. (1983.S.2)

Shop and Field Sketches Objective
Students will:
1983.2.1 Draw shop or field sketches of sample dimensions, notes, and specifications.

Standard 3: Identify and interpret basic welding symbols. (1983.S.3)

Welding Symbols Objectives
Students will:
1983.3.1 Differentiate common types of welds and joints.
1983.3.2 Identify weld symbols and draw samples of each.
1983.3.3 Match parts of a fillet weld and a groove weld with their geometric definitions.
1983.3.4 Draw fillet and groove weld symbols with different requirements.
1983.3.5 Interpret common abbreviations for blueprints and welding processes.

Standard 4: Understand the composition of metals, their atomic structures and properties, and how they behave when exposed to different conditions of use. (1983.S.4)

Metals Objectives
Students will:
1983.4.1 Define metallurgy and describe historical developments.
1983.4.2 Define terms related to metallurgy.
1983.4.3 Distinguish between mechanical and physical properties.
1983.4.4 Compare chemical characteristics of ferrous and non-ferrous metals.
1983.4.5 Describe in writing, various heat treating processes.
1983.4.6 Explain welding characteristics of low, medium, and high carbon steel, alloy steels, cast iron, stainless and high chromium steels, Austenitic manganese steels, tool and die steels, and exotic steels.

Fundamentals of Welding Technology

This course will introduce students to the basic fundamentals of welding/cutting. Students will become familiar with general safety, welding terms and joints, and oxyfuel welding techniques.

Standard 1: Identify, explore, and evaluate career opportunities related to welding. (1985.S.1)

Career Opportunities Objectives
Students will:
1985.1.1 Describe a variety of careers related to welding, and the training necessary to be successful in those careers.
1985.1.2 Develop appropriate attitudes and behaviors required to succeed in careers in the field of welding.
1985.1.3 Identify sources of information about careers in welding.

Standard 2: Identify and practice safety during tool and equipment use and practice safe conduct in welding shop. (1985.S.2)

Welding Shop Objectives
Students will:
1985.2.1 Recognize and follow general welding shop safety guidelines.
1985.2.2 Discuss the precautions needed to avoid fires in the welding area.
1985.2.3 Describe how a closed container can be welded.
1985.2.4 Describe the precautions to be taken when welding in confined areas.
1985.2.5 Explain the purpose of tinted lenses used during welding and cutting.
1985.2.6 Describe the protective clothing, eye, face and head gear worn by welder.
1985.2.7 Recognize what fumes, gases, dust and smoke must be removed.
1985.2.8 List and describe electrical safety when using ARC welding equipment.
1985.2.9 Illustrate safe handling and storage of compressed gas cylinders and explain safety involved with use of acetylene gas.

Standard 3: Express knowledge of the basic terms and processes associated with the welding industry. (1985.S.3)

Welding Industry Objectives
Students will:
1985.3.1 Tell what the American Welding Association does for welders.
1985.3.2 Define welding and explain coalescence and filler material.
1985.3.3 State the difference between fusion welding, brazing, soldering and solid-state welding.
1985.3.4 List the major welding fusion welding processes and state the differences between them.
1985.3.5 Discuss the purpose and functions of SMAW electrodes.

Standard 4: Setup oxyfuel welding and cutting equipment and demonstrate the safe use of the equipment. (1985.S.4)

Oxyfuel Welding and Cutting Equipment Objectives
Students will:
1985.4.1 Obtain oxyfuel cylinders, chain into work station, assemble and set up oxy fuel stationary and mobile cutting equipment.
1985.4.2 Perform soap and water leak test and set line pressure according to the tip size and metal thickness.
1985.4.3 Lay out pattern on metal using steel rule, square and soapstone.
1985.4.4 Make 90 degree straight cuts, bevel cuts and hole cuts.

1985.4.5 List five (5) reasons for poor cuts and four (4) causes for back fire.

1985.4.6 Clean and maintain cutting equipment and demonstrate proper shut down and storage of the equipment.

1985.4.7 Choose the proper tip size for braze welding and oxyacetylene welding, light and adjust flame for proper welding of mild steel.

Gas Metal Arc Welding

This course will introduce students to basic skills in gas metal arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Gas Metal Arc welding equipment. (1987.S.1)

Gas Metal Arc Objectives
Students will:
1987.1.1 Perform safety inspections of equipment and accessories.
1987.1.2 Make minor external repairs to equipment and accessories.
1987.1.3 Set up for gas metal arc welding operations on plain carbon steel.
1987.1.4 Operate gas metal arc welding equipment.

Standard 2: Perform GMAW using short circuit transfer. (1987.S.2)

Short Circuit Transfer Objectives
Students will:
1987.2.1 Make fillet welds, all positions, on plain carbon steel.
1987.2.2 Make groove welds, all positions, on plain carbon steel.

Standard 3: Perform GMAW using Sray transfer. (1987.S.3)

Sray Transfer Objectives
Students will:
1987.3.1 Make 1F-2F welds on plain carbon steel.
1987.3.2 Make 1G welds on plain carbon steel.

Standard 4: Set up and use Flux Cored Arc welding equipment (FCAW, FCAW-G). (1987.S.4)

Flux Cored Arc Objectives
Students will:
1987.4.1 Perform safety inspections of equipment and accessories.
1987.4.2 Make minor external repairs to equipment and accessories.
1987.4.3 Set up for flux cored arc welding operations on plain carbon steel.
1987.4.4 Operate flux cored arc welding equipment.
1987.4.5 Make fillet welds, all positions, on plain carbon steel.
1987.4.6 Make groove welds, all positions, on plain carbon steel.

Gas Tungsten Arc Welding

This course will introduce students to basic skills in gas tungsten arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Gas Tungsten Arc welding equipment. (1989.S.1)

Gas Tungsten Arc Welding Objectives

The student will

1989.1.1 Perform safety inspections of equipment and accessories.
1989.1.2 Make minor external repairs to equipment and accessories.
1989.1.3 Set up for gas tungsten arc welding operations on plain carbon steel, aluminum, and stainless steel.
1989.1.4 Operate gas tungsten arc welding equipment.
1989.1.5 Make fillet welds, all positions, on plain carbon steel.
1989.1.6 Make groove welds all positions, on plain carbon steel.
1989.1.7 Make 1F-2F welds on aluminum.
1989.1.8 Make 1G welds on aluminum.
1989.1.9 Make 1F-3F welds on stainless steel.
1989.1.10 Make 1G-2G welds on stainless steel.

Shielded Metal Arc Welding

This course will introduce students to basic skills in shielded metal arc welding. Students should have good eye, hand coordination and a safety awareness. All students who take this class must have successfully completed Fundamentals of Welding and have passed all safety tests.

Standard 1: Setup and use Shielded Metal Arc welding equipment in all positions. (1993.S.1)

Shielded Metal Arc Objectives

Students will:

1993.1.1 Perform safety inspections of equipment and accessories.
1993.1.2 Make minor external repairs to equipment and accessories.
1993.1.3 Setup for SMAW operations on plain carbon steel.
1993.1.4 Operate SMAW equipment.
1993.1.5 Make fillet welds in all positions on plain carbon steel.
1993.1.6 Make groove welds in all positions on carbon steel.
1993.1.7 Perform horizontal and vertical limited thickness qualification test on carbon steel plate.
1993.1.8 Interpret test results.
1993.1.9 Discuss electrode handling procedures.
1993.1.10 Finish metal surfaces with hand and power tools.

Thermal Cutting and Welding

This course will introduce students to the basic fundamentals to effectively use the oxyfuel welding and cutting processes to produce welded and brazed joints, and to cut straight lines and shapes.

Standard 1: Set up oxyfuel cutting equipment and demonstrate it's safe use. (1995.S.1)

Oxyfuel Cutting Equipment Objectives
Students will:
1995.1.1 Describe historical developments in thermal cutting and welding.
1995.1.2 Recognize safety related to thermal cutting.

Standard 2: Perform manual oxyfuel gas cutting and demonstrate it's safe use. (1995.S.2)

Manual Oxyfuel Gas Cutting Objectives
Students will:
1995.2.1 Perform safety inspections of equipment and accessories.
1995.2.2 Make minor repairs to equipment and accessories.
1995.2.3 Set up for manual oxyfuel gas cutting operations.
1995.2.4 Perform oxyfuel gas cutting, beveling, and piercing operations.
1995.2.5 Perform arc cutting, beveling, and piercing operations.
1995.2.6 Perform shape cutting and bevel cutting operations on plain carbon steel.
1995.2.7 Remove weld metal from plain carbon steel by using weld washing technique.

Standard 3: Perform oxyfuel welding and brazing and demonstrate it's safe use. (1995.S.3)

Oxyfuel Welding and Brazing Objectives
Students will:
1995.3.1 Perform safety inspections of equipment and accessories.
1995.3.2 Set and weld mild steel using oxyfuel welding equipment.
1995.3.3 Set and braze mild steel using oxyfuel welding equipment.

Standard 4: Perform machine oxyfuel gas cutting (OFC) and demonstrate it's safe use. (1995.S.4)

Machine Oxyfuel Gas Cutting Objectives
Students will:
1995.4.1 Perform safety inspections of equipment and accessories.
1995.4.2 Make minor external repairs to equipment and accessories.
1995.4.3 Set up for manual air carbon arc gouging and cutting operations on plain carbon steel.
1995.4.4 Operate manual air carbon arc cutting equipment.
1995.4.5 Perform metal removal operations on plain carbon steel.

Standard 5: Set up and safe use of plasma arc cutting (PAC) equipment. (1995.S.5)

Plasma Arc Cutting Objectives
Students will:
1995.5.1 Perform safety inspections on equipment and accessories.
1995.5.2 Make minor external repairs to equipment and accessories.
1995.5.3 Set up for manual plasma arc cutting operations on plain carbon steel, aluminum, and stainless steel.
1995.5.4 Operate manual plasma arc cutting equipment.
1995.5.5 Perform shape cutting operations on plain carbon steel, aluminum, and stainless steel.

Exploring Technology (2401-2409 inclusive)

Exploring technology is a comprehensive, action based educational program for middle school concerned with the ways that humans use communication, manufacturing, transportation and construction to adapt to their environment. It is necessary for all people to understand technology if they are to function as informed voters, productive workers and wise consumers of technological products. Content and activities involve students' use of tools, materials and processes.

Standard 1: Systems Model (2401.S.1)
Students will understand the concept of a systems model and how it applies to technology.

Systems Model Objectives
Students will:
2401.1.1 Define technology and its four major systems: communication, transportation, construction and manufacturing.
2401.1.2 Name the parts of a technological system, and describe each of the four systems using this model.

Standard 2: Technical Developments (2401.S.1)
Students will recognize the evolving nature of technology and describe its potential for impacting the future.

Technical Developments Objectives
Students will:
2401.2.1 Identify and describe important historical developments in the evolution of technology.
2401.2.2 Use past and present technological developments to predict trends and possible future developments.

Standard 3: Academic Applications (2401.S.3)
Students will integrate academic skills with technological knowledge when solving problems.

Academic Applications Objectives
Students will:
2401.3.1 Solve math and measurement problems as they relate to specific technological systems.
2401.3.2 Apply vocabulary and reading comprehension skills to the study of technology.
2401.3.3 Develop and organize a presentation to inform by using: written, graphic, and verbal techniques.
2401.3.4 Apply concepts of science to real world technological problems.
2401.3.5 Demonstrate the use of critical thinking skills when analyzing technological solutions.
2401.3.6 Use computer hardware and software where applicable in the study of technology.

Standard 4: Problem Solving (2401.S.4)
Students will develop and demonstrate technological problem solving skills and processes when developing solutions to problems.

Problem Solving Objectives
Students will:
2401.4.1 Generate ideas and design solutions to problems through sketches, drawings and notes.
2401.4.2 Plan and select the materials, energy, tools and processes needed and produce a physical model or prototype of the solution.
2401.4.3 Test the solution.
2401.4.4 Analyze test results and evaluate the success of the solution.

Standard 5: Resources (2401.S.5)
Students will solve problems and make decisions involving resources to create and improve technological systems.

Resources Objectives
Students will:
2401.5.1 Define the term "resource", and list resources in a given technological system.
2401.5.2 Use and reuse a variety of resources in an efficient manner.
2401.5.3 Demonstrate proper use and care of tools and equipment.
2401.5.4 Identify and practice all given safety rules when using materials and equipment in laboratory and classroom activities.
2401.5.5 Use tools, machines and equipment at an appropriate skill level to separate materials; change the shape of materials; join materials; and process information.

Standard 6: Communication Systems (2401.S.6)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of communication systems.

Communication Systems Objectives
Students will:
2401.6.1 Demonstrate proper layout and design principles when designing messages.
2401.6.2 Identify and properly construct the three principle views of an object using sketching and/or drafting tools and techniques.
2401.6.3 Compare and contrast each of the major printing methods used in industry and use at least two methods to make prints which convey a message.
2401.6.4 Explain the basic electrical concepts necessary to operate a simple circuit, and simulate one communication device by constructing a working model.
2401.6.5 Describe major telecommunication devices, and experiment with at least one device in an activity.

Standard 7: Construction Systems (2401.S.7)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of construction systems.

Construction Systems Objectives
Students will:
2401.7.1 Identify a variety of different types of structures, and explain the various uses made of them.
2401.7.2 Explain how loads and forces affect a structural system.
2401.7.3 Identify basic structural elements and techniques used in light construction, and use at least three in classroom activities.
2401.7.4 Identify basic structural elements and techniques used in heavy construction, and use at least one in a classroom activity.
2401.7.5 Compare and contrast the characteristics of a variety of construction materials in relation to their intended purpose.
2401.7.6 Explain the importance of blueprints, specifications, and scheduling of labor and materials to the management of a construction project.

Standard 8: Manufacturing Systems (2401.S.8)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of manufacturing systems.

Manufacturing Systems Objectives
Students will:
2401.8.1 Describe methods used to acquire a variety of raw material resources, including woods, metals, plastics and ceramics.

2401.8.2 Explain the importance of standard stock, and the various methods that industry uses to convert raw materials into standard stock.
2401.8.3 Compare and contrast the various forming operations (casting/molding, compressing/ stretching, and conditioning) and perform at least one operation in each category.
2401.8.4 Compare and contrast the various separating operations (shearing, chip removal, other) and perform at least one operation in each category.
2401.8.5 Compare and contrast the various combining operations (mechanical fastening, adhesive bonding, cohesive bonding coating, and mixing) and perform at least one operation in each category.
2401.8.6 Describe the five organizational departments of a manufacturing company.
2401.8.7 Participate in the establishment and production of a product in student-organized company.

Standard 9: Transportation Systems (2401.S.9)
Students will explore a variety of resources, processes and outcomes necessary for the development and support of transportation systems.

Transportation Systems Objectives
Students will:
2401.9.1 Identify and describe the four environments in which vehicles operate.
2401.9.2 Classify transportation devices according to four operating environments.
2401.9.3 Determine the advantages and disadvantages of a variety of modes of transportation according to their purpose.
2401.9.4 Define the six technical sub-systems of a transportation device.
2401.9.5 Explore a variety of modes of transportation by designing, producing, operating and analyzing the efficiency of at least two models.

Standard 10: Leadership (2401.S.10)
Students will function as a leader, follower, organizer and planner.

Leadership Objectives
Students will:
2401.10.1 Demonstrate the value of working independently and cooperatively in activities.
2401.10.2 Develop civic pride and responsibility by participating in service activities to benefit others.
2401.10.3 Experience leadership development through participation in Technology Student Association activities.

Standard 11: Impacts (2401.S.11)
Students will identify societal problems and environmental impacts that result from the use of technological products and processes.

Impacts Objectives
Students will:
2401.11.1 List several social changes brought about by developments in technology.
2401.11.2 Describe the positive and negative implications that various technologies have had on the environment.
2401.11.3 Explain the impact of renewable and non-renewable resources on the individual, society and the environment.

Standard 12: Careers (2401.S.12)
Students will identify and explore major career opportunities in the engineering and technical field.

Careers Objectives

Students will:

2401.12.1 Use available resources to research a variety of careers associated with engineering and technical fields.

2401.12.2 Evaluate a variety of engineering and technical careers as they relate to personal interests and aptitudes.

Communication Systems

This course will introduce students to a variety of ways that people use tools and resources to communicate. Topics include the processes of communication, the sources of energy used to communicate, and the technological advancements that are rapidly affecting the world. Students will explore various applications in communication technology through hands-on activities.

Standard 1: Background (2421.S.1)
Students will describe the communication system, its development and importance in the world today.

Background Objectives
Students will:
2421.1.1 Define communication technology, listing the inputs, processes, outputs and feedback and give examples of each.
2421.1.2 Identify and describe important inventions and developments in communication technology.
2421.1.3 Examine the advantages and disadvantages of a variety of graphic and electronic communication methods as to their efficiency (economics, speed, effectiveness).

Standard 2: Communication Applications (2421.S.2)
Students will use oral and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2421.2.1 Use a variety of techniques to access information and use the information to solve design problems in communication.
2421.2.2 Write a technical report explaining a specific communication process, which reflects appropriate technical style, and use word processing software to generate the report.
2421.2.3 Prepare and deliver a 3-5 minute speech on a given topic in communication.
2421.2.4 Apply vocabulary and reading comprehension skills used in communication occupations.
2421.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2421.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to communication careers.

Mathematical Applications Objectives
Students will:
2421.3.1 Perform mathematical computations as they relate to communication activities (page layout, circuitry problems, etc.)
2421.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2421.S.4)
Students will apply the basic steps in the problem solving process to develop solutions to a variety of communication problems.

Problem Solving Objectives
Students will:
2421.4.1 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2421.4.2 Plan and select materials, energy, tools and processes needed for producing solutions to a variety of problems, and use them to solve a variety of problems.
2421.4.3 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.

2421.4.4 Interpret the information gained, and evaluate the success of solutions.

Standard 5: Safety (2421.S.5)
Students will develop appropriate health and safety practices associated with the communication system.

Safety Objectives
Students will:
2421.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the communication laboratory.
2421.5.2 Describe safety measures and industrial laws and regulations used by communication industries to protect workers on the job.

Standard 6: Mechanical Drawing (2421.S.6)
Students will effectively use mechanical drawing and CAD to communicate graphically.

Mechanical Drawing Objectives
Students will:
2421.6.1 Correctly use a variety of drafting tools to create drawings.
2421.6.2 Use an introductory CAD program to produce a simple drawing, demonstrating basic functions of CAD.
2421.6.3 Correctly draw the necessary views for given orthographic drawings.
2421.6.4 Correctly draw an isometric drawing of a given object and use it in the design of a message.

Standard 7: Layout and Design (2421.S.7)
Students will design and create a variety of graphic messages using proper techniques.

Layout and Design Objectives
Students will:
2421.7.1 Describe the elements and principles of design (color, shape, line, texture, proportion, balance, rhythm, and unity) and apply them when designing a poster.
2421.7.2 Demonstrate proper techniques for producing a thumbnail, rough layout and comprehensive mechanical layout.
2421.7.3 Use desktop publishing software to create a one-page flyer advertising a given item.
2421.7.4 Describe common methods of creating a printed image, and compare various reproduction methods.

Standard 8: Graphic Arts (2421.S.8)
Students will define the general steps necessary to produce a printed product (image design, generation and assembly, carrier preparation, transfer, and product finishing).

Graphic Arts Objectives
Students will:
2421.8.1 Compare and contrast a variety of techniques used to duplicate messages.
2421.8.2 Choose the appropriate method and reproduce a selected project, explaining the reason for your choice of printing method.

Standard 9: Telecommunication (2421.S.9)
Students will examine the processes used in electronic communication and their applications.

Telecommunication Objectives
Students will:
2421.9.1 Explain the basic principles of electricity as they relate to the operation of various communication devices.
2421.9.2 Explain the principle of electromagnetism as it relates to communication and construct a device

that operates on this principle.

2421.9.3 Identify the four basic requirements for an electrical circuit and solve a communication problem involving simple circuitry.

2421.9.4 Define the processes of encoding, transmitting, receiving, storing, retrieving, and decoding information.

2421.9.5 Utilize a commercial electronic communication device (video equipment, laser/fiber optics, computer/modem) to design, send, and receive a message, describing the six processes involved.

Standard 10: Impacts (2421.S.10)

Students will examine the impacts and future implications of communication systems as they relate to society, the economy, and the environment.

Impacts Objectives

Students will:

2421.10.1 Discuss several social changes brought about by technological developments in the communication industry.

2421.10.2 Explain how our economy is affected by developments in communication systems and give examples.

2421.10.3 Describe positive and negative implications that various communication technologies have had on the environment.

2421.10.4 Discuss a variety of future developments in communication and their possible effects on society, the economy and the environment.

Construction Systems

This course will introduce students to the principles of the construction industry. Topics range from how construction meets the needs of society to basic construction techniques. Students will explore various applications in construction technology through hands on activities.

Standard 1: Background (2424.S.1)
Students will describe the construction system, its development and importance in the world today.

Background Objectives
Students will:
2424.1.1 Define construction technology, listing the inputs, processes, outputs and feedback and give examples of each.
2424.1.2 Compare and contrast various types of structures and uses made of them.
2424.1.3 Identify and describe important inventions and developments in construction technology.

Standard 2: Communications Applications (2424.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2424.2.1 Use a variety of techniques to access information and use the information to solve design problems in construction.
2424.2.2 write a technical report explaining a specific construction process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2424.2.3 Prepare and deliver a 3-5 minute speech on a given topic in construction.
2424.2.4 Apply vocabulary and reading comprehension skills used in construction occupations.

Standard 3: Mathematical Applications (2424.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to construction careers.

Mathematical Applications Objectives
Students will:
2424.3.1 Perform mathematical computations as they relate to construction activities (calculating square feet, foundation layouts, triangulation, etc.).
2424.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2424.S.4)
Students will apply the basic steps in the problem solving process to develop solutions to a variety of construction problems.

Problem Solving Objectives
Students will:
2424.4.1 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2424.4.2 Plan and select materials, energy, tools and processes needed for producing solutions to a variety of problems, and use them to solve a variety of problems.
2424.4.3 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.
2424.4.4 Interpret the information gained, and evaluate the success of solutions.

Standard 5: Safety (2424.S.5)
Students will develop appropriate health and safety practices associated with the construction system.

Safety Objectives
Students will:
2424.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the construction laboratory.
2424.5.2 Describe safety measures and industrial laws and regulations used by construction industries to protect workers on the job.

Standard 6: Resources (2424.S.6)
Students will identify, evaluate, and select common tools, materials, energy, and information to design, engineer, and produce structures.

Resources Objectives
Students will:
2424.6.1 Describe a variety of construction materials, and conduct tests on common structural materials to determine their physical characteristics.
2424.6.2 Perform various forming, separating, and combining processes on construction materials.

Standard 7: Forces and Loads (2424.S.7)
Students will identify and examine the forces and loads acting upon structural elements.

Forces and Loads Objectives
Students will:
2424.7.1 differentiate between the forces that act on structures (tension, compression, shear, and torsion), and determine which forces are present in various structural elements.
2424.7.2 Differentiate between static, continuous dynamic, and impact dynamic loads, and give examples of each.
2424.7.3 Calculate load stress in a structure and give the answer in load per square inch or load per square foot.

Standard 8: Producing Structures (2424.S.8)
Students will understand the processes used to design, engineer, and produce a variety of types of structures.

Producing Structures Objectives
Students will:
2424.8.1 Differentiate between light and heavy construction by identifying structures, structural elements, and building techniques used in each type of construction.
2424.8.2 Identify several points which must be considered when evaluating a potential construction site, and identify an acceptable location for a structure, given a properly prepared plot plan.
2424.8.3 Design a living space, identifying basic and non-basic activity areas; plan traffic flow pattern and efficient room layout.
2424.8.4 Given a cross sectional view of a foundation and framed superstructure, explain the purpose of each, and identify several structural parts.
2424.8.5 Explain the basic steps of enclosing a structure.
2424.8.6 Describe the importance of insulating a structure and identify the five paths of heating/ cooling loss in a home.
2424.8.7 Identify internal and external utility systems.
2424.8.8 Describe several internal and external finishing processes.
2424.8.9 Describe a variety of heavy construction projects (dams, highways, bridges, and pipelines) and their relationship to the transportation industry.

2424.8.10 Participate in the various steps, from planning to finished construction, of a model scale structure.

Standard 9: Managing Construction Projects (2424.S.9)
Students will understand the processes related to managing a construction project.

Managing Construction Projects Objectives
Students will:
2424.9.1 Define and describe the three activities of management (planning, organizing, and controlling).
2424.9.2 Describe how a contractor organizes a construction project, including the concept of subcontracting, controlling construction costs, and scheduling of required inspections.

Standard 10: Impacts (2424.S.10)
Students will understand the impacts and future implications of construction systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:
2424.10.1 Discuss several social changes brought about by technological developments in the construction industry.
2424.10.2 Explain how our economy is affected by developments in construction systems and give examples.
2424.10.3 Describe positive and negative implications that various construction technologies have had on the environment.
2424.10.4 Discuss a variety of future developments in construction and their possible effects on society, the economy and the environment.

Foundations In Engineering

This course will introduce students to the basic principles of materials, mechanisms, structures, electricity, electronic control, fluidics, and graphic communication and how they can be integrated and used to solve a variety of complex technical challenges. Students work in engineering teams to develop work process skills, such as researching, writing, organizing, modeling, calculating, and communicating with others.

Standard 1: Problem Solving (2436.S.1)
Students will understand the basic steps in the problem solving process to develop solutions to a variety of technological problems.

Problem Solving Objectives
Students will:
2436.1.1 Identify and describe the four basic steps in the problem solving process.
2436.1.2 Explain at least four factors that influence the design process.

Standard 2: Conducting Research (2436.S.2)
Students will understand how to generate ideas and use a variety of information gathering techniques to conduct research and gather data.

Conducting Research Objectives
Students will:
2436.2.1 Use a variety of divergent and convergent methods (mind mapping, brainstorming, consensus) to generate ideas, organize thoughts, and represent relationships between concepts.
2436.2.2 Generate ideas and design solutions to solve problems through sketches, drawings and notes.
2436.2.3 Discuss the purpose and importance of research in the design process.
2436.2.4 Apply vocabulary and reading comprehension skills used in engineering.
2436.2.5 Effectively use a variety of information gathering techniques to compile research information for designs.
2436.2.6 Properly document information gained from any resource.
2436.2.7 Develop and use a questionnaire or interview guide designed to gain specific information from people, then use spreadsheet software to design a chart or graph to display the data gathered.
2436.2.8 Conduct destructive and nondestructive tests on a variety of materials to determine their characteristics, collect data and produce a computer graph to display information about a material's properties.
2436.2.9 Determine which specific materials are most appropriate for a given product, and justify your answer.

Standard 3: Documenting Design Work (2436.S.3)
Students will understand the importance of documenting design work and use a variety of methods to record design ideas.

Design Work Objectives
Students will:
2436.3.1 Describe various methods to document design work.
2436.3.2 Provide three good reasons for documenting design work.
2436.3.3 Create a design portfolio, using a variety of methods to document your design work.
2436.3.4 Use desktop publishing software to create a variety of titles, graphics and layouts for your portfolio.
2436.3.5 Properly sketch and dimension a variety of drawings using orthographic projection and pictorial drawing techniques.

2436.3.6 Create technical sketches that depict various details of a product.
2436.3.7 Use computer assisted drafting to communicate graphic solutions to a variety of problems.

Standard 4: Factors Affecting Design (2436.S.4)
Students will consider the various factors that affect design when creating solutions to problems. Demonstrate how to gather anthropometrics data, and apply it to the design of products.

Factors Affecting Design Objectives
Students will:
2436.4.1 Specify the functional criteria of a variety of consumer products.
2436.4.2 Effectively apply the elements and principles of design when creating solutions to problems.
2436.4.3 Describe the internal and external forces that are exerted on a structure, and explain why they need to be considered in the design of an object.
2436.4.4 Compare and contrast various structural elements and apply them to the solution of design problems.

Standard 5: Technological Resources (2436.S.5)
Students will understand and integrate a variety of technological resources to produce models to design problems.

Technological Resources Objectives
Students will:
2436.5.1 Define and describe the difference between appearance models, working models, prototypes, and computer models.
2436.5.2 Plan and select appropriate materials needed for producing solutions to a variety of problems.
2436.5.3 Identify a variety of tools and equipment and methods used to control them.
2436.5.4 Describe general safety rules and demonstrate safe use of any tool or piece of equipment that may be used in the engineering/ technical laboratory.
2436.5.5 Perform various forming, separating, and combining processes when creating models for design solutions.
2436.5.6 Demonstrate how various mechanisms, including gear trains, pulleys, cams, cranks, links and levers affect changing types of movement.
2436.5.7 Describe and apply the concept of mechanical advantage, velocity ratio, and efficiency.
2436.5.8 Explain the relationship between current, voltage, and resistance, and use appropriate meters to measure each.
2436.5.9 Describe the operation of and properly use a variety of switches, diodes, variable resistors, and fuses to create circuits to solve design problems.
2436.5.10 Correctly draw a diagram of a circuit and build the circuit from the diagram.
2436.5.11 Describe the purpose of and use various sensing devices (switches, temperature and light sensors) and actuator devices (buzzers, lamps) and use them in control circuits.
2436.5.12 Explain the nature of digital signals in electronic circuits and represent them in binary arithmetical form.
2436.5.13 Apply common digital processing blocks used in electronic circuits such as AND and OR gates in the solution of problems.
2436.5.14 Explain the concept of 3 port and 5 port valves, and single and double acting cylinders, and use them to control design solutions.
2436.5.15 Explain the concept of controlling the speed of cylinders and use a variety of controlling arrangements such as delay circuits, (reservoirs, restrictors, and/or valves) to produce delays, AND, OR and NOT functions.
2436.5.16 Describe the locus of moving points in mechanisms and explain how cylinders are mounted to provide appropriate angular travel.
2436.5.17 Demonstrate the ability to integrate the various technologies and use them to build models of working solutions.

Standard 6: Testing and Analyzing (2436.S.6)
Students will understand the importance of testing and analyzing a design solution and use the information for improvement.

Testing and Analyzing Objectives
Students will:
2436.6.1 Choose and conduct the appropriate tests to gather data on the efficiency of solutions to problems.
2436.6.2 Interpret the information gained by calculating the efficiency of a given design.
2436.6.3 Analyze test results and use them to suggest redesign strategies.

Standard 7: Presenting Information (2436.S.7)
Students will demonstrate a variety of methods to present information.

Presenting Information Objectives
Students will:
2436.7.1 Write objective reports reflecting appropriate technical style, and use word processing software to generate the report.
2436.7.2 Prepare and deliver a 3-5 minute speech on a given topic.
2436.7.3 Design and create an effective physical display to explain the solution to a specific design problem.
2436.7.4 Design and create a variety of publications and displays by hand and with desktop publishing software.
2436.7.5 Prepare and deliver a 3-5 minute multimedia presentation on a given topic.

Standard 8: Leadership (2436.S.8)
Students will develop personal responsibility and leadership skills through participation in engineering team activities.

Leadership Objectives
Students will:
2436.8.1 Share responsibility of the problem solving process in a group.
2436.8.2 Demonstrate the value of working independently and cooperatively in activities.

Standard 9: Careers (2436.S.9)
Students will explore a variety of careers that are involved in the engineering field, and the skills, qualifications and requirements necessary to work in this field.

Careers Objectives
Students will:
2436.9.1 Define at least five types of engineers, and give examples of how they use the design process in their specific jobs.
2436.9.2 Discuss a variety of businesses and industries that use design engineers, and what type of work each does.
2436.9.3 Examine the skills and training necessary to be successful in an engineering career.

Manufacturing Systems

This course will introduce students to the basic elements of the manufacturing industry. Students will explore a variety of materials and processing techniques common to manufacturing, and apply this knowledge to the development and operation of a student manufacturing enterprise.

Standard 1: Background (2442.S.1)
Students will describe the manufacturing system, its development and importance in the world today.

Objectives
Students will:
2442.1.1 Define manufacturing technology, listing the inputs, processes, outputs and feedback and give examples of each.
2442.1.2 Describe the stages of manufacturing, from securing raw materials to distributing the finished product.
2442.1.3 Identify and describe important inventions and developments in manufacturing technology.

Standard 2: Communication Applications (2442.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2442.2.1 Use a variety of techniques to access information and use it to solve design problems in manufacturing.
2442.2.2 Write a technical report explaining a specific manufacturing process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2442.2.3 Prepare and deliver a 3-5 minute speech on a given topic in manufacturing.
2442.2.4 Apply vocabulary and reading comprehension skills used in manufacturing occupations.
2442.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2442.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to manufacturing careers.

Mathematical Applications Objectives
Students will:
2442.3.1 Perform mathematical computations as they relate to manufacturing activities (calculating break even points, board feet, bills of materials, etc.).
2442.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Management (2442.S.4)
Students will discuss and apply standard forms of management, which are used in the manufacturing industry.

Management Objectives
Students will:
2442.4.1 Develop a management team to run a simulated company, using it to improve quality, productivity, and economic competitiveness in manufacturing.

Standard 5: Research and Development (2442.S.5)
Students will understand processes used to conduct research and develop products by a manufacturing enterprise.

Research and Development Objectives
Students will:
2442.5.1 Practice a variety of ways to generate ideas to solve problems.
2442.5.2 Conduct a market survey to determine the potential sales of a product you have designed.
2442.5.3 Design and construct a working model of a potential product.
2442.5.4 Use testing strategies to evaluate the model, and analyze the information gained through testing to evaluate the success of the product.

Standard 6: Finances and Accounting (2442.S.6)
Students will apply processes used to manage finances in a manufacturing industry.

Finances and Accounting Objectives
Students will:
2442.6.1 Estimate fixed and variable manufacturing costs.
2442.6.2 Prepare a master budget and maintain a general ledger.

Standard 7: Safety (2442.S.7)
Students will develop appropriate health and safety practices associated with the manufacturing system.

Safety Objectives
Students will:
2442.7.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the manufacturing laboratory.
2442.7.2 Describe safety measures and industrial laws and regulations used by manufacturing industries to protect workers on the job.

Standard 8: Industrial Relations (2442.S.8)
Students will identify processes used to promote good industrial relations.

Industrial Relations Objectives
Students will:
2442.8.1 Describe the three (3) major types of industrial relations (employee, labor, public) and list several functions of each.

Standard 9: Resources (2442.S.9)
Students will identify and select common materials, tools, and equipment and use them to design and produce products.

Resources Objectives
Students will:
2442.9.1 Identify common materials (metallic, ceramic, natural and synthetic polymers) and describe their characteristic properties.
2442.9.2 Identify various types of tools and equipment and the methods used to safely control them.
2442.9.3 Form and/or separate standard stock into one piece products or components of multiple piece products.
2442.9.4 Combine components into subassemblies and final products.

Standard 10: Producing Products
Students will demonstrate and understand processes used to plan for and produce high quality products.

Producing Products Objectives
Students will:

2442.10.1 Describe the five major activities that occur in the manufacturing area (planning, control, plant engineering, quality control, and material processing).

2442.10.2 Describe the similarities and differences of custom, intermittent, and continuous flow techniques.

2442.10.3 Develop an operation flow chart.

2442.10.4 Develop a flow process chart (operations, delays, etc.) for a product.

2442.10.5 Construct jigs/fixtures required for a manufacturing run.

2442.10.6 Apply intermittent (job lot) production techniques to prepare standard stock for a continuous flow production, using appropriate jigs and fixtures.

2442.10.7 Apply continuous flow production techniques to produce a finished product using appropriate jigs and fixtures.

2442.10.8 Compare and contrast the prevention (SPC) and the detection (inspection) system of quality control.

Standard 11: Impacts (2442.S.11)
Students will examine the impacts and future implications of manufacturing systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:

2442.11.1 Discuss several social changes brought about by technological developments in the manufacturing industry.

2442.11.2 Explain how our economy is affected by developments in manufacturing systems and give examples.

2442.11.3 Describe positive and negative implications that various manufacturing technologies have had on the environment.

2442.11.4 Discuss a variety of future developments in manufacturing and their possible effects on society, the economy and the environment.

Mechanical Services Systems

This course will introduce students to the basic principles of mechanisms, electricity/electronics and fluidics involved in the support, maintenance, design and installation of all types of mechanical and electrical devices. Students will explore a variety of techniques used in the mechanical services industry, and apply this knowledge in a variety of hands-on activities.

Standard 1: Background (2445.S.1)
Students will describe the mechanical services system, its development and importance in the world today.

Background Objectives
Students will:
2445.1.1 Define mechanical services technology.
2445.1.2 Identify and describe important inventions and developments in the evolution of the mechanical services industry.

Standard 2: Communication Applications (2445.S.1)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2445.2.1 Use a variety of techniques to access information and use it to solve design problems in mechanical services.
2445.2.2 Write a technical report explaining a specific mechanical services process, which reflects appropriate technical style, and use word processing software to generate the report.
2445.2.3 Prepare and deliver a 3-5 minute extemporaneous speech on a given topic in mechanical services.
2445.2.4 Apply vocabulary and reading comprehension skills used in mechanical services.
2445.2.5 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 3: Mathematical Applications (2445.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to mechanical services careers.

Mathematical Applications Objectives
Students will:
2445.3.1 Continue to use English and Metric measurements accurately.
2445.3.2 Perform mathematical computations as they relate to mechanical services activities (calculating break-even points, board feet, bills of materials, etc.)
2445.3.3 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: Problem Solving (2445.S.4)
Students will apply design, creativity and critical thinking skills to develop solutions to a variety of problems to meet specific criteria.

Problem Solving Objectives
Students will:
2445.4.1 Generate ideas and design solutions to problems through sketches, drawings, and notes.
2445.4.2 Plan and select the materials, energy, tools, and processes needed for producing solutions to mechanical services problems, and produce solutions to a variety of mechanical services

problems.

2445.4.3 Test the solution to a variety of mechanical services problems, and analyze test results to valuate the success of solutions.

Standard 5: Safety (2445.S.5)
Students will develop appropriate health and safety practices associated with the mechanical services industry.

Safety Objectives
Students will:
2445.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the mechanical services field and in the training laboratory.
2445.5.2 Describe safety measures and industrial laws and regulations used by companies to protect mechanical services workers on the job.

Standard 6: Electricity and Electronics (2445.S.6)
Students will explain the basic principles of electricity and electronics as they relate to the various operations involved in mechanical services.

Electricity and Electronics Objectives
Students will:
2445.6.1 Identify the basic requirements for an electrical circuit and solve problems involving simple circuitry.
2445.6.2 Explain the principle of electro-magnetism and describe devices that operate on this principle.
2445.6.3 Identify and explain electric control of pneumatic and hydraulic systems (single and multiple gas and fluid systems).

Standard 7: Fluidics (2445.S.7)
Students will explain the basic principles of fluidics as they apply to the various devices and operations in mechanical services.

Fluidics Objectives
Students will:
2445.7.1 Compare and contrast basic principles of pneumatics and hydraulics, and describe devices that operate on each principle.
2445.7.2 Demonstrate typical industrial compressed air systems, explaining the various types of controls used.
2445.7.3 Memorize and use accepted practices and nomenclatures for lubricants and oils used in fluidics.
2445.7.4 Demonstrate how flow and pressure control systems, fluid pumps, motors and actuators function

Standard 8: Mechanisms (2445.S.8)
Students will understand and demonstrate the proper use of lubricants and mechanical practices.

Mechanisms Objectives
Students will:
2445.8.1 Describe friction bearings and mechanical seals and their uses.
2445.8.2 Explain the difference between oil, grease and synthetic lubricants and their use.
2445.8.3 Describe the operation of fluid motors and pumps which require alignment of drive mechanisms (shimming, etc.).
2445.8.4 Install piping, tubing and fittings used in mechanical services.

2445.8.5 Explain the difference between gears, levers, pulleys and types of bearings

Standard 9: Impacts (2445.S.9)
Students will understand the impacts and future implications of mechanical services systems as they relate to individuals, society, and the economic, environmental, and technological systems.

Impacts Objectives
Students will:

2445.9.1 Discuss several social changes brought about by the development of mechanical services technology.

2445.9.2 Explain how mechanical services technology affects our economic system and give examples.

2445.9.3 Describe positive and negative implications that various mechanical services technologies have had on the environment.

2445.9.4 Discuss a variety of future developments in mechanical services and their possible effects on society.

Transportation Systems

This course will introduce students to the use of tools and resources to relocate people and goods. Topics range from the subsystems of transportation to the sources of energy used in the industry. Students will explore various applications in transportation technology through hands on activities.

Standard 1: Background (2448.S.1)
Students will describe the transportation system, its development and importance in the world today.

Background Objectives
Students will:
2448.1.1 Define transportation technology in terms of the systems model, listing the inputs, processes, outputs and feedback and give examples of each.
2448.1.2 Identify and describe important inventions and developments in transportation technology.
2448.1.3 Determine the advantages and disadvantages of selected modes of transportation in relation to its efficiency (speed, payload, economics, safety).

Standard 2: Communication Applications (2448.S.2)
Students will use oral, graphic and written communication skills to effectively deliver a variety of messages.

Communication Applications Objectives
Students will:
2448.2.1 Use a variety of techniques to access information and use it to solve design problems in transportation.
2448.2.2 Write a technical report explaining a specific transportation process, which reflects appropriate technical style, and use word processing software to generate the technical report.
2448.2.3 Prepare and deliver a 3-5 minute extemporaneous speech on a given topic in transportation.
2448.2.4 Apply vocabulary and reading comprehension skills used in transportation occupations.

Standard 3: Mathematical Applications (2448.S.3)
Students will apply accurate measurement practices, solve math problems, and perform algebraic computations as they relate to transportation careers.

Mathematical Applications Objectives
Students will:
2448.3.1 Perform mathematical computations as they relate to transportation activities (calculating speed, loads, lift, etc.)
2448.3.2 Interpret various charts, graphs and drawings used to display numerical data.

Standard 4: **Problem Solving (2448.S.4)**
Students will apply design, creativity and critical thinking skills to develop solutions to a variety of problems involving different technologies to meet specific criteria.

Problem Solving Objectives
Students will:
2448.4.1 Practice a variety of ways to generate ideas to solve problems.
2448.4.2 Plan and select the materials, energy, tools, and processes needed for producing solutions to transportation problems, and produce solutions for a variety of problems.
2448.4.3 Use several testing strategies to evaluate the solution to transportation problems, and analyze information gained through testing to evaluate the success of solutions.
2448.4.4 Create a design portfolio to use the remainder of the semester to document your design work.

Standard 5: Safety (2448.S.5)

Students will develop appropriate health and safety practices associated with the transportation industry.

Safety Objectives
Students will:
2448.5.1 Explain and demonstrate general safety rules and the proper use of tools, machines, and equipment in the transportation laboratory.
2448.5.2 Describe safety measures and industrial laws and regulations used by transportation industries to protect workers on the job.

Standard 6: Power and Energy (2448.S.6)
Students will understand the role that energy plays in producing power for transportation and how power systems convert energy into work.

Power and Energy Objectives
Students will:
2448.6.1 Define energy and the three major categories of energy sources (renewable, non-renewable, and inexhaustible), listing several examples of each.
2448.6.2 Explain the Law of Conservation of Energy.
2448.6.3 Define mechanical advantage and describe how the six simple machines provide mechanical advantage to a vehicle.
2448.6.4 Define power and describe the three major power systems used in transportation (mechanical, electrical, fluid), listing several examples.
2448.6.5 Illustrate the types of gears used in transmission of power, and calculate gear ratio and direction.

Standard 7: Propulsion Sub-Systems (2448.S.7)
Students will explain the operation of various propulsion systems used in transportation.

Propulsion Sub-Systems Objectives
Students will:
2448.7.1 Define propulsion, and describe the three major types of energy converters used in transportation (heat engines, electric systems, hybrid systems).
2448.7.2 Describe the effect that friction has on the movement of a vehicle.
2448.7.3 Compare and contrast 2-stroke and 4-stroke engines.
2448.7.4 Compare and contrast propulsion systems used in air transport: reciprocating and jet engines.

Standard 8: Structural Sub-Systems (2448.S.8)
Students will describe the purpose of structural systems and analyze designs as to their efficiency.

Structural Sub-Systems Objectives
Students will:
2448.8.1 Explain the various structural design criteria including: human, safety, and economic factors, giving examples.
2448.8.2 Describe various materials used in vehicle structures (body, hull, fuselage) and why each is used.
2448.8.3 Design and construct a model vehicle, which demonstrates efficient aerodynamic or hydrodynamic design.

Standard 9: Suspension Sub-Systems (2448.S.9)
Students will compare and contrast various types of suspension systems and explain their purpose in vehicles.

Suspension Sub-Systems Objectives
Students will:
2448.9.1 Define suspension, and list the three types of suspension systems, giving examples of each (mechanical, fluid, magnetic).
2448.9.2 Describe the main components of suspension systems used in land transportation.
2448.9.3 Explain Bernoulli's Principle, describing the forces that affect an aircraft in flight.
2448.9.4 Define buoyancy and explain how it provides suspension to marine craft.
2448.9.5 Explain why aerodynamic devices (airfoils) are not effective in space.

Standard 10: Support Sub-Systems (2448.S.10)
Students will describe the function of support systems for the transportation industry.

Support Sub-Systems Objectives
Students will:
2448.10.1 Explain the need for each of the five types of support systems used in transportation (life, legal, operations, maintenance, economic).

Standard 11: Guidance Sub-Systems (2448.S.11)
Students will explain guidance systems and why they are an integral part of any transportation system.

Guidance Sub-Systems Objectives
Students will:
2448.11.1 Explain the purpose of guidance systems in transportation.
2448.11.2 Describe several types of visual and electronic guidance systems and give examples of where each would most commonly be found.

Standard 12: Control Sub-Systems (2448.S.12)
Students will describe the purpose of control systems in transportation systems.

Control Sub-Systems Objectives
Students will:
2448.12.1 Describe the two major categories of control systems: speed and direction.
2448.12.2 Demonstrate the concept of movement about axes (roll, pitch, yaw) in a variety of modes.
2448.12.3 Define random and fixed routes, and briefly explain directional control in both.
2448.12.4 Describe the various ways to control speed and direction in land transportation vehicles.
2448.12.5 Identify and describe the control surfaces on an aircraft and how they function.

Standard 13: Impacts (2448.S.13)
Students will examine the impacts and future implications of transportation systems as they relate to society, the economy, and the environment.

Impacts Objectives
Students will:
2448.13.1 discuss several social changes brought about by technological developments in the transportation industry.
2448.13.2 Explain how our economy is affected by developments in transportation systems and give examples.
2448.13.3 Describe positive and negative implications that various transportation technologies have had on the environment.
2448.13.4 Discuss a variety of future developments in transportation and their possible effects on society, the economy and the environment.

Travel West Virginia

This course provides students with an awareness of the impact of tourism in West Virginia. Students study the eight tourism regions of the state, the history, heritage, culture and geography of the state related to tourism and the role that marketing plays in building our tourism industry. Hospitality careers are also covered.

Standard 1: Develop an appreciation for and promote a sense of pride in the state of West Virginia.
(7663.S.1)

Pride in the State Objectives
Students will:
7663.1.1 Describe and have an understanding of how stereotypes and prejudice can negatively impact West Virginia.
7663.1.2 Evaluate stereotypes used to describe West Virginia and determine their validity.
7663.1.3 List places of interest in West Virginia.
7663.1.4 Analyze slogans that promote West Virginia.
7663.1.5 Explain reasons why people should come to West Virginia.

Standard 2: Demonstrate an understanding of historical/geographical places of interest in West Virginia. (7663.S.2)

Historical/Geographical Objectives
Students will:
7663.2.1 Locate on a map the eight tourist regions of West Virginia.
7663.2.2 Draw conclusions about West Virginia's eight tourist regions from maps, pictures, charts and graphs.
7663.2.3 Explain how the physical geography of West Virginia supports tourism.
7663.2.4 Identify the location of places of historical significance in West Virginia.
7663.2.5 Identify the location of places of recreational interest in West Virginia and distinguish which are natural and man-made.
7663.2.6 Categorize historical/geographical places of interest by tourist region.
7663.2.7 Categorize historical places of interest by time period.

Standard 3: Analyze the potential for tourism in West Virginia. (7663.S.3)

Tourism Objectives
Students will:
7663.3.1 Define tourism.
7663.3.2 Identify the location and role of the Convention and Visitors' Bureaus.
7663.3.3 List reasons people travel.
7663.2.4 List the major population centers that are within a 500-mile radius of West Virginia.
7663.2.5 Evaluate misconceptions about tourism.
7663.2.6 Interpret data regarding tourism in West Virginia.
7663.2.7 List categories of tourism and give examples of each.
7663.2.8 Define target markets.
7663.2.9 List target markets for tourism and compare/contrast each.
7663.2.10 Evaluate the importance of preservation, e.g., natural beauty, historical significance vs. economic progress.
7663.2.11 Explain how ethnicity impacts tourism.
7663.2.12 Analyze data to determine leisure travel habits of potential target markets.
7663.2.13 Describe internal and external factors that motivate people to travel.

Standard 4: Explore careers in the hospitality and tourism industry. (7663.S.4)

Careers in Hospitality and Tourism Objectives
Students will:
7663.4.1 List careers in hospitality and tourism.
7663.4.2 Categorize jobs in hospitality and tourism, e.g., entry level, CEO.
7663.4.3 Explain how a hobby can become a career.
7663.4.4 Define entrepreneur.
7663.4.5 Evaluate how careers in hospitality/tourism can change over time.
7663.4.6 Compare job opportunities in each of the eight tourist regions.
7663.4.7 Identify personal traits that are necessary for a successful career in the hospitality industry.
7663.4.8 Identify benefits of a career in hospitality/tourism.
7663.4.9 Demonstrate skills necessary to ensure a successful interview.
7663.4.10 Demonstrate the ability to complete an application form.
7663.4.11 Explain the role an employee fills in promoting tourism.
7663.4.12 Describe the steps in looking for a job.
7663.4.13 Define career ladder.

Standard 5: Develop skills and competencies necessary for success in any occupation as identified by the Secretary's Commission on Achieving Necessary Skills. (SCANS) (7663.S.5)

SCANS Objectives
Students will:
7663.5.1 Define SCANS.
7663.5.2 Identify basic skills necessary for workplace competency.
7663.5.3 Identify personal skills essential for workplace competency.
7663.5.4 List the functional skills necessary for workplace success and cite examples of each.
7663.5.5 Identify workplace competencies found in everyday activities.

Standard 6: Compare economic opportunities in different regions of the state. (7663.S.6)

Economic Opportunities Objectives
Students will:
7663.6.1 List businesses affected by tourism.
7663.6.2 Categorize the effect of tourism on select businesses as direct or indirect.
7663.6.3 Assess the impact of interstate highways on the economic development of West Virginia.
7663.6.4 Explain reasons businesses locate in specific areas.
7663.6.5 Identify the role of lodging and restaurants to the promotion of tourism.
7663.6.6 Identify industries and products that are important to West Virginia's economy.
7663.6.7 Analyze the strengths and weaknesses of each of the eight tourist regions and make recommendations for economic development in each.
7663.6.8 Give examples of historical structures that have been used for economic development.
7663.6.9 Evaluate the economic impact of special events, e.g., fairs festivals.
7663.6.10 Analyze how an increase of decrease in tourism affects businesses.

Standard 7: Develop an understanding of the role marketing plays in tourism. (7663.S.7)

Role Marketing Plays in Tourism Objectives
Students will:
7663.7.1 Define marketing.
7663.7.2 List the 5 P's of marketing.
7663.7.3 Distinguish between a product and service.
7663.7.4 Evaluate the factors that make tourism a product or a service.
7663.7.5 List factors to consider when describing a target market.

7663.7.6 Explain the role market research plays in the tourist industry.
7663.7.7 Evaluate information from a variety of sources and formulate a marketing plan for your local tourist region.
7663.7.8 Describe the elements of a marketing plan.
7663.7.9 Explain how increased tourism brings added demands on public facilities/services.
7663.7.10 Explain the role promotion plays in marketing.
7663.7.11 Compare/contrast the importance of a campaign theme.

FORM HD 201
(10-66)

FISCAL NOTE WORKSHEET
(Submit 4 Copies)

HD NO _____ DRAFT NO _____ BILL NO _____ RESOLUTION NO _____ _____

SUBJECT **Policy 2520: Content Standards and Objectives for West Virginia Schools**

FUND General

SOURCE OF REVENUE: ☐ GENERAL FUND ☐ SPECIAL ☐ OTHER (SPECIFY) _____

COST OF ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

INCOME ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

SHOW OVER-ALL EFFECT IN ITEMS 1 AND 2 & GIVE EXPLANATION OF BREAKDOWN BY FISCAL YEAR INCLUDING LONG-RANGE EFFECT

EFFECT OF PROPOSAL	ANNUAL INCREASE	ANNUAL DECREASE		FISCAL YEAR CURRENT	FISCAL YEAR NEXT	FISCAL YEAR THEREAFTER	
1. ESTIMATED TOTAL COST	$ -0-	$ - 0 -		$ - 0 -	$ -0-	$ -0-	
PERSONAL SERVICES CURRENT EXPENSES REPAIRS/ALTERATIONS EQUIPMENT OTHER	$	$		$	$	$	
2. ESTIMATED TOTAL REVENUES	$ -0-	$ - 0 -		$ - 0 -	$ -0-	$ -0-	

3. EXPLANATION OF ABOVE ESTIMATES (INCLUDING LONG-RANGE EFFECT):

DATE: 4/4/02

AGENCY: West Virginia Department of Education

AUTHORIZED REPRESENTATIVE: _____

POLICY 2520
CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS
COMMENT RESPONSE FORM

Comment Period Ends: June 21, 2002

Please use this form when commenting on proposed Policy 2520. You may attach additional sheets if necessary.

Individual/Organization: _____

Title: _____

Street Address: _____

City/State/Zip Code: _____

NOTE: There are no changes to the Content Standards and Objectives for Mathematics, Reading/English Language Arts, Science, Social Studies and Technology and we will not accept comments on those sections.

General:

Agricultural Education:

Business Education:

Diversified Cooperative Training:

Family and Consumer Sciences:

Health Occupations:

Lodging Management:

Marketing Education:

Occupational Family & Consumer Science:

Technical and Industrial Education:

Technology Education:

Travel West Virginia:

Please return comments to:

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Charleston, West Virginia 25305-0330